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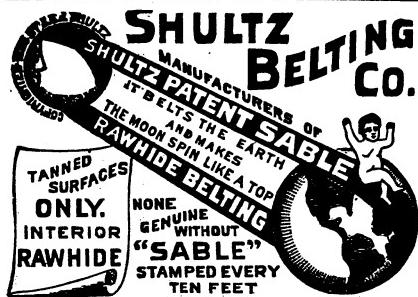
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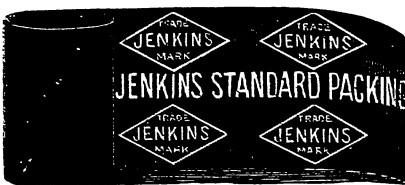
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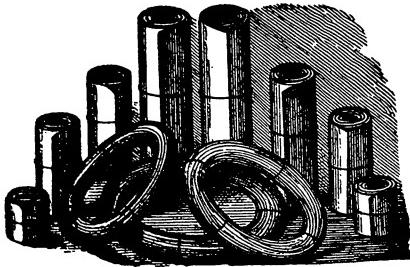
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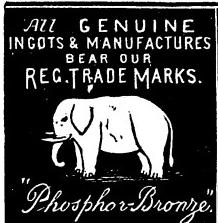
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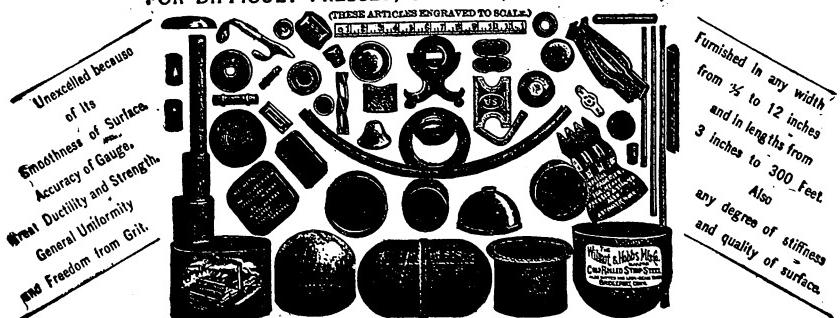
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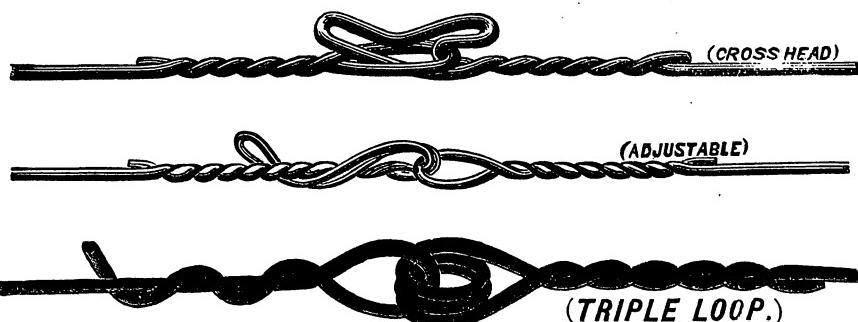
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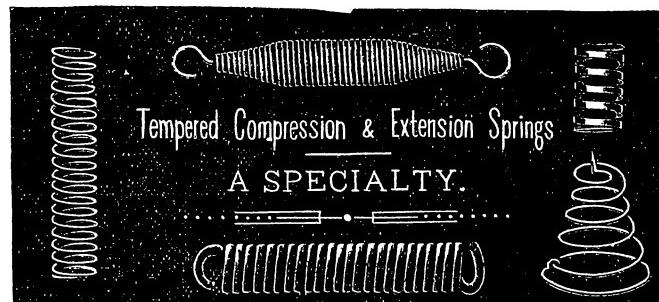
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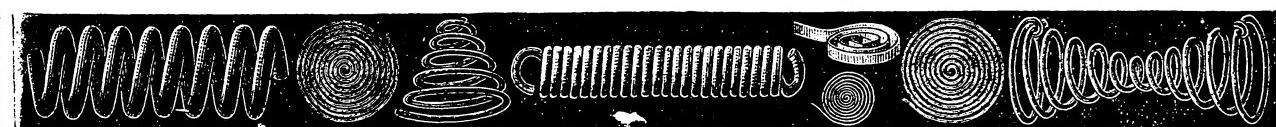
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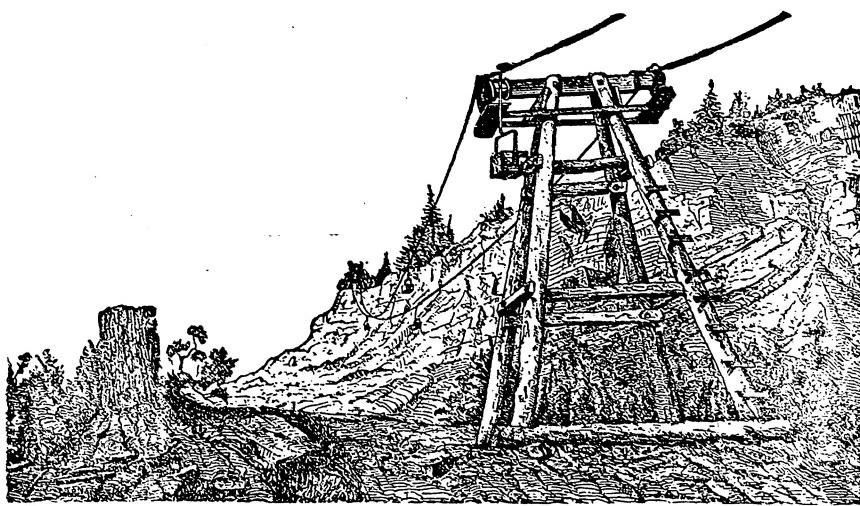
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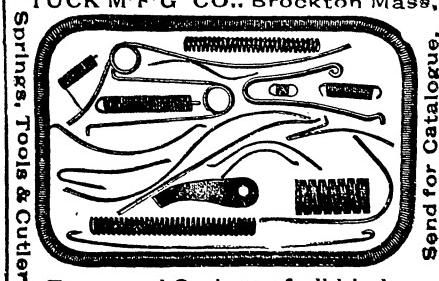
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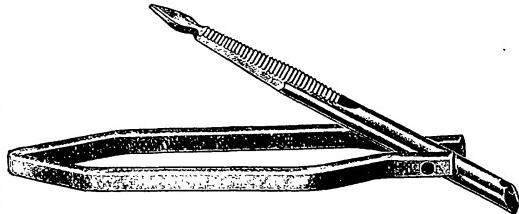


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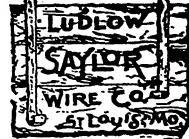
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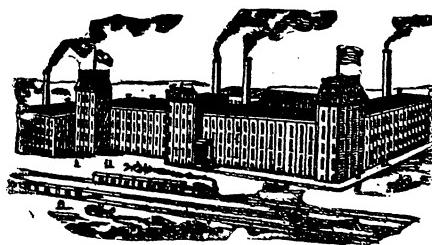
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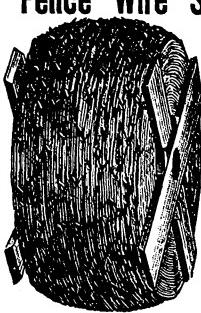
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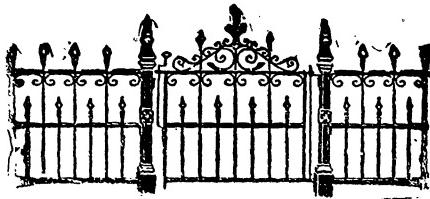
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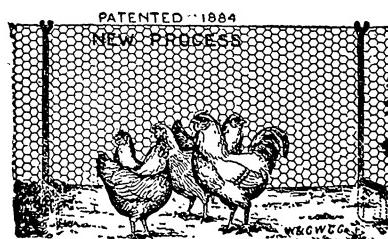
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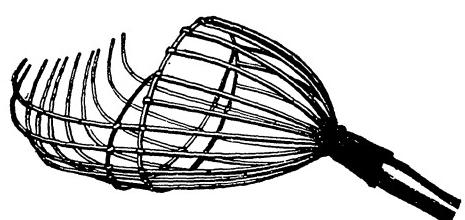


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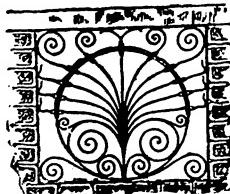
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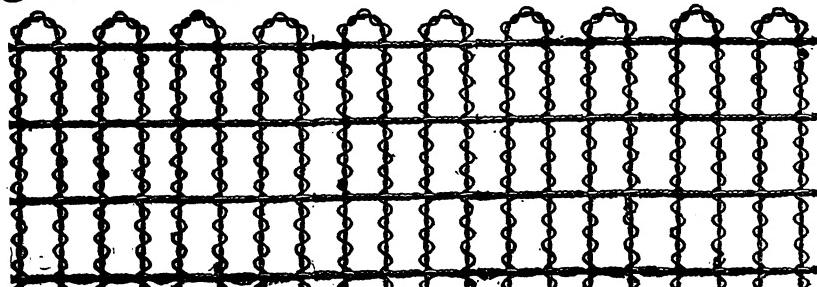
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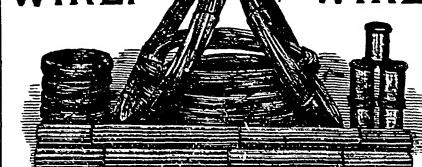
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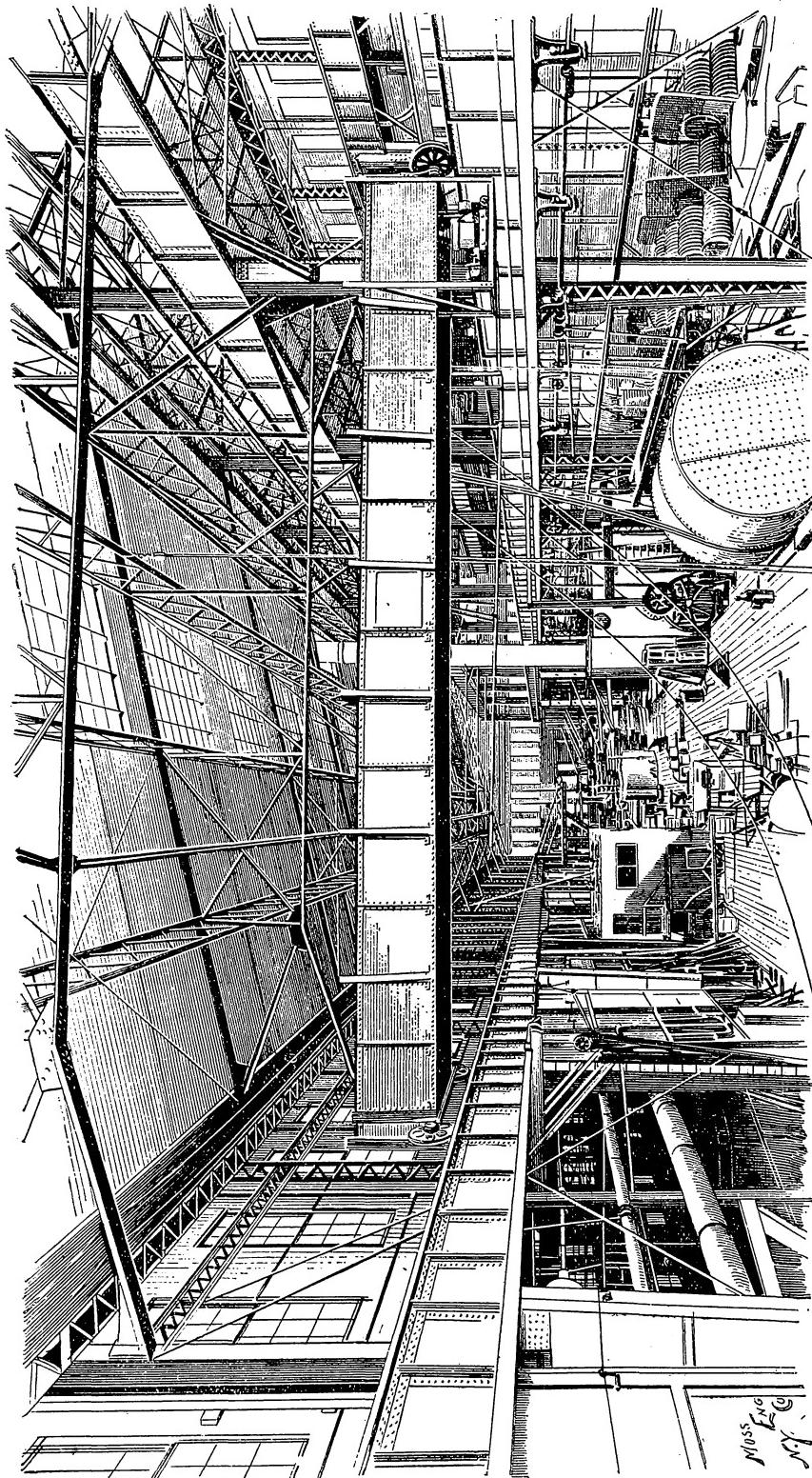
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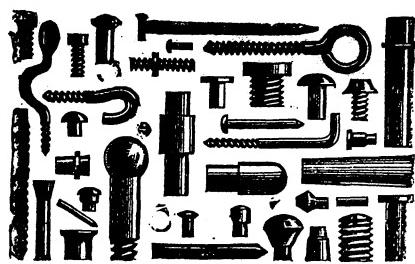
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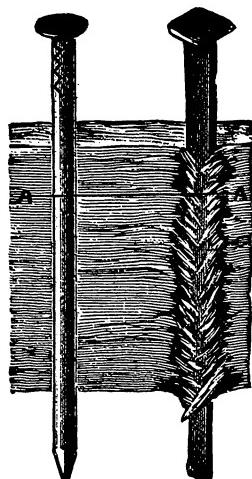
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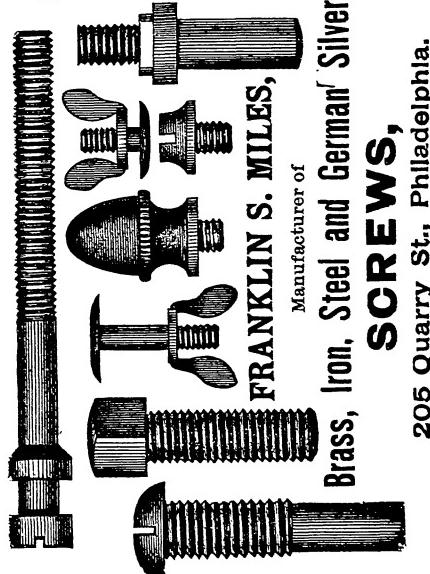
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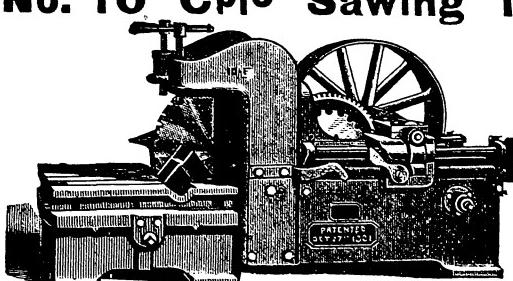
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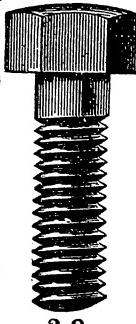
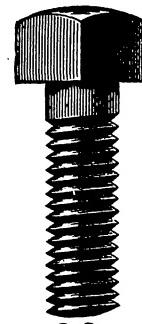
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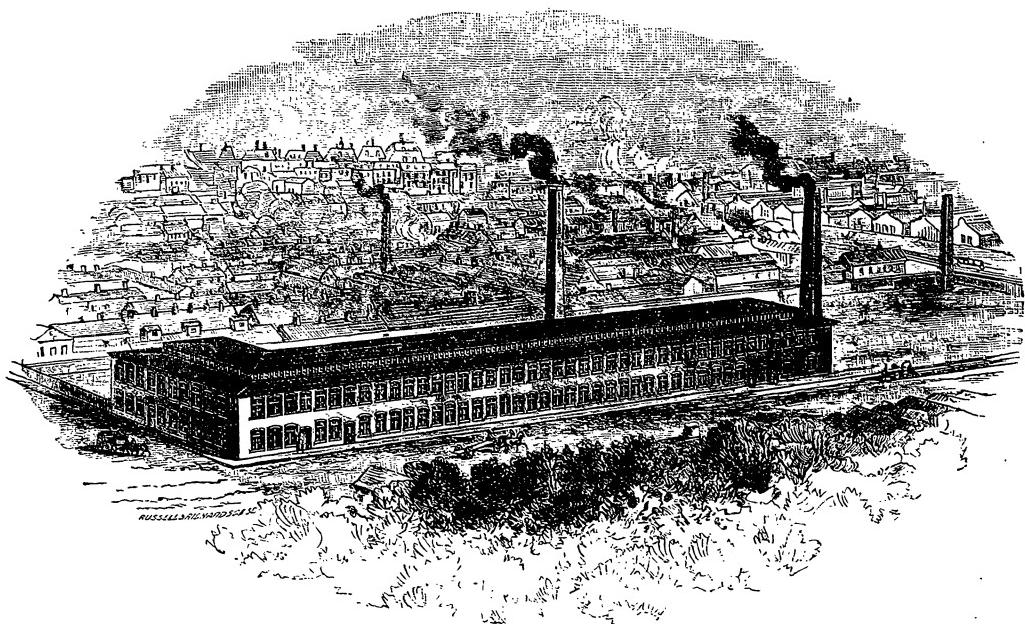
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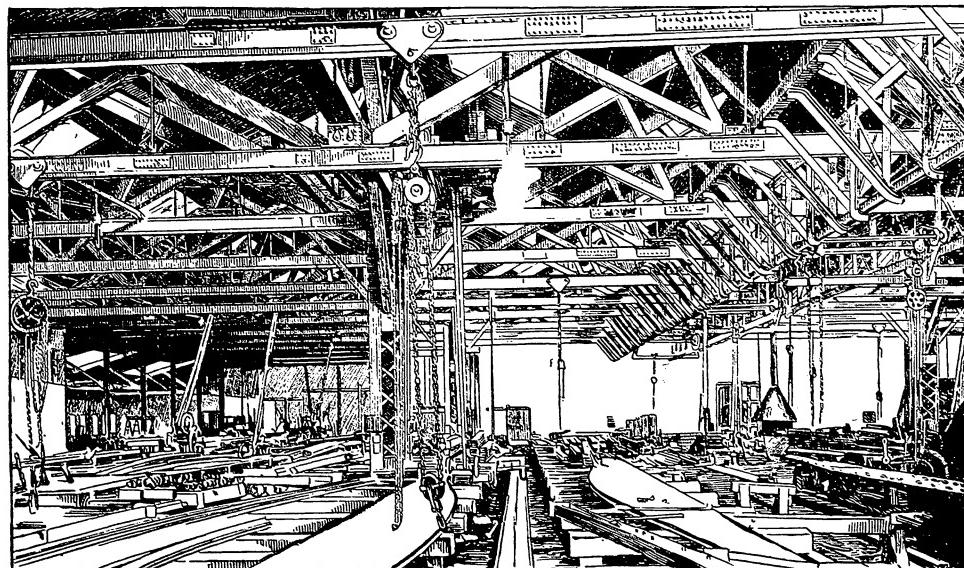
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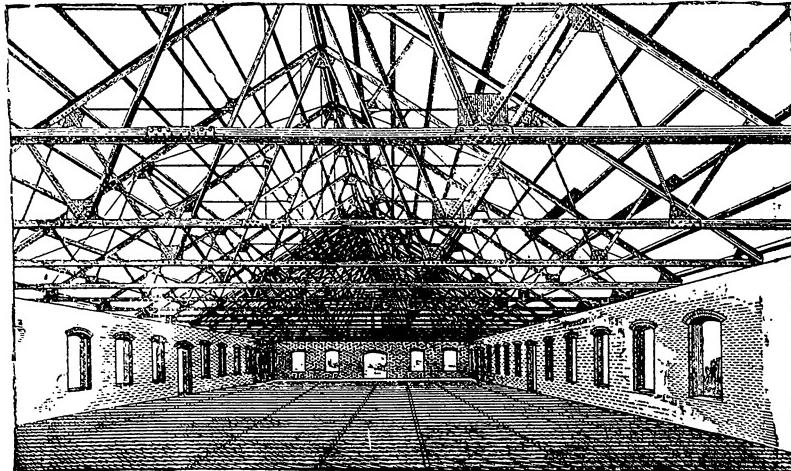
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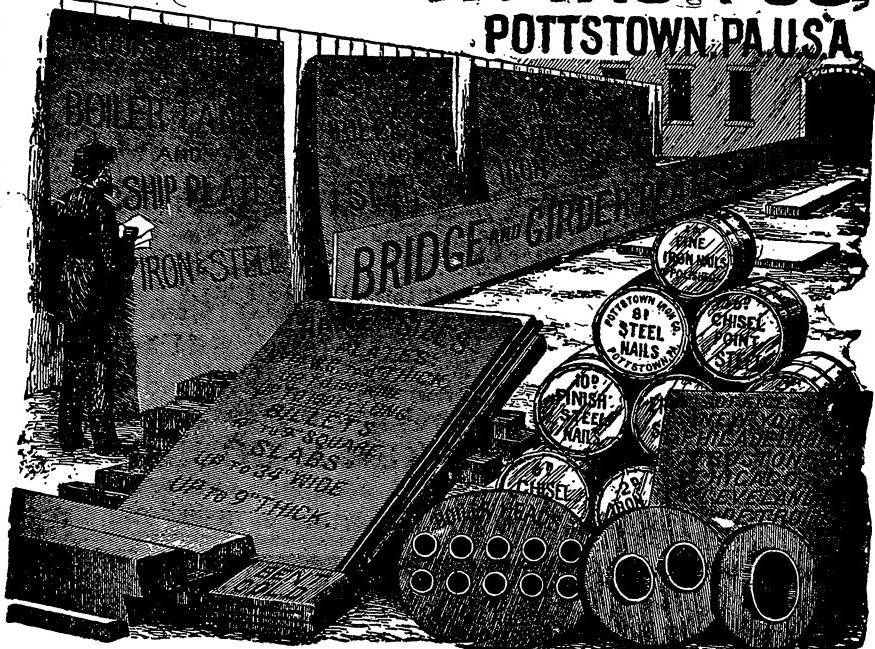
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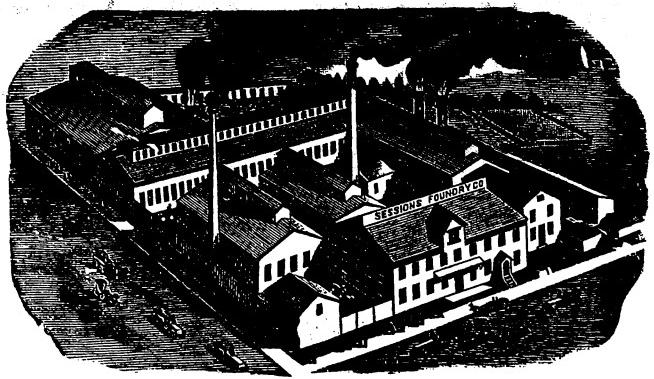
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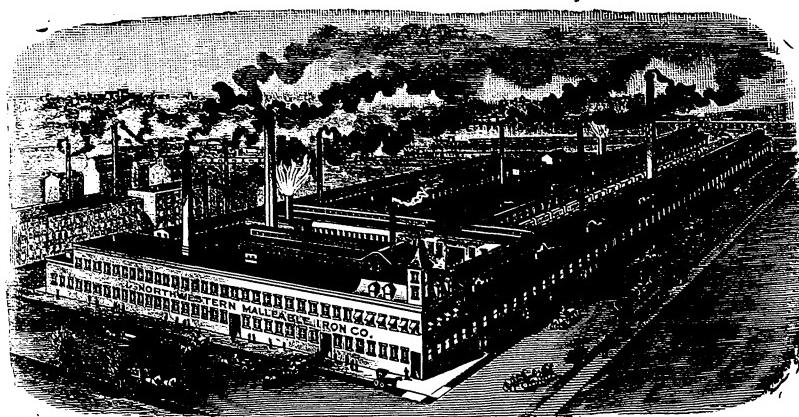
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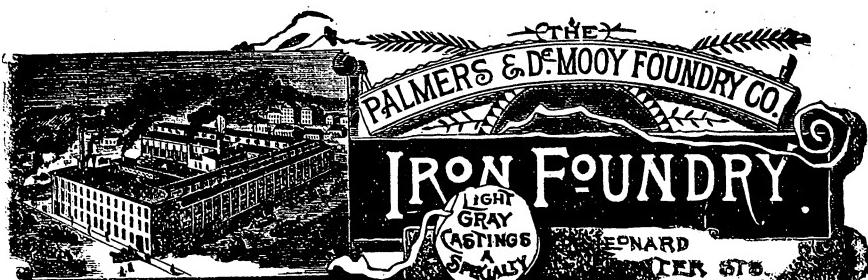
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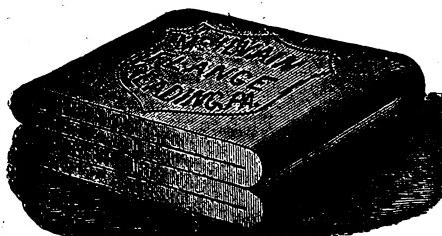
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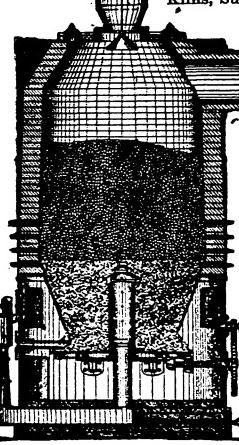
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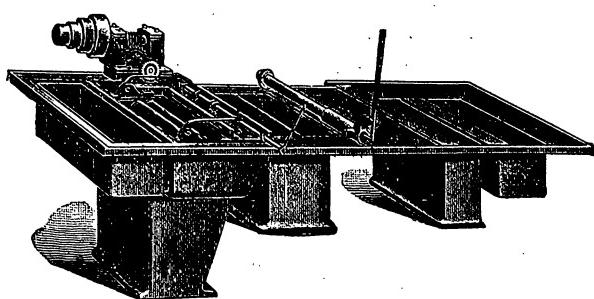
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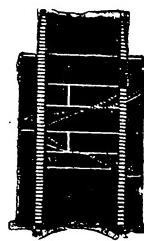
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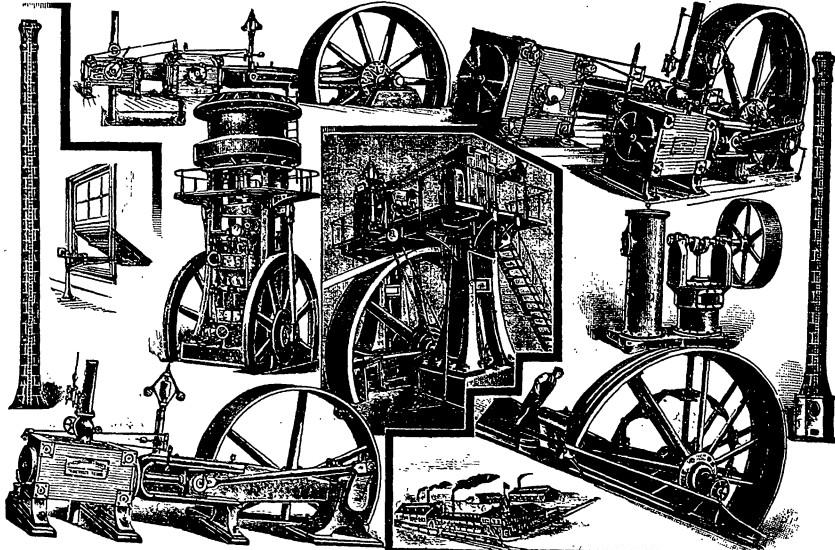
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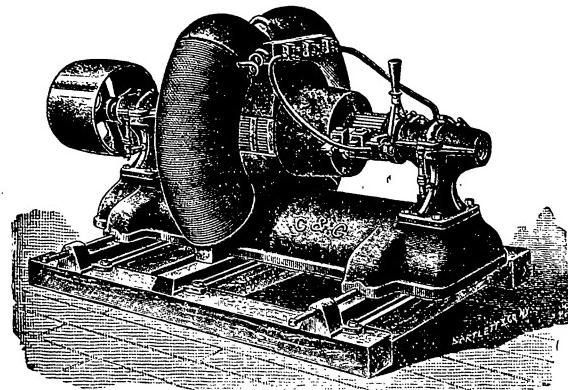
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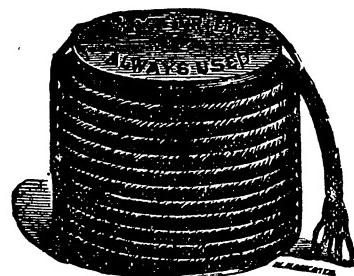
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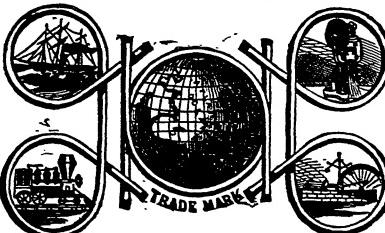
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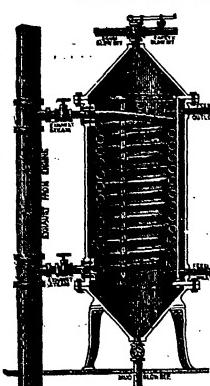


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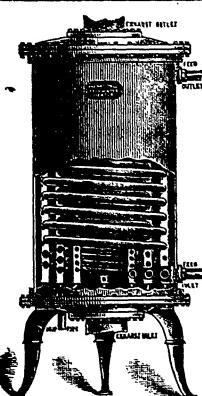
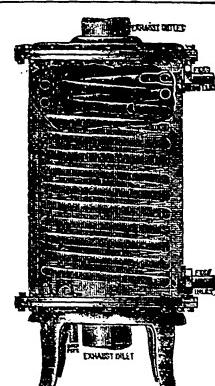
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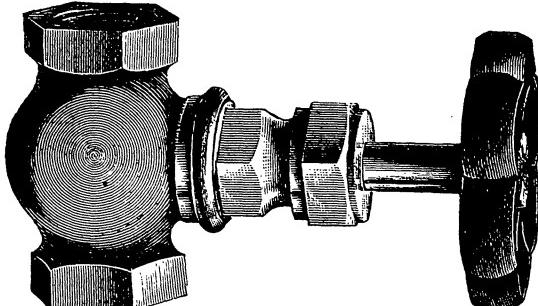


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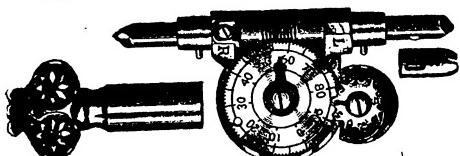
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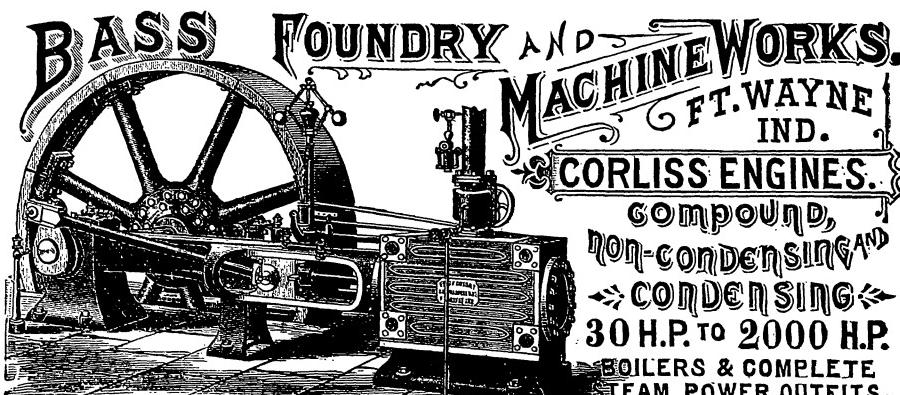
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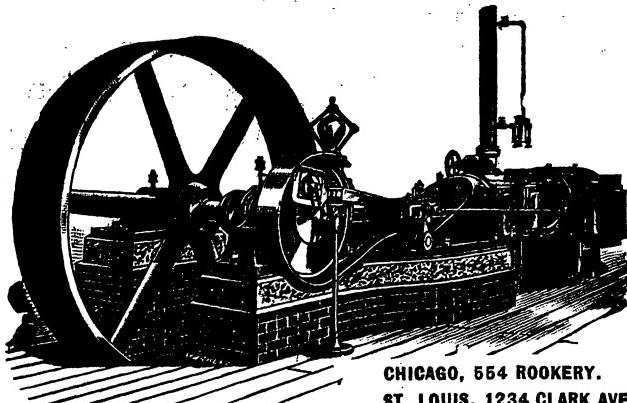
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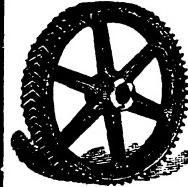
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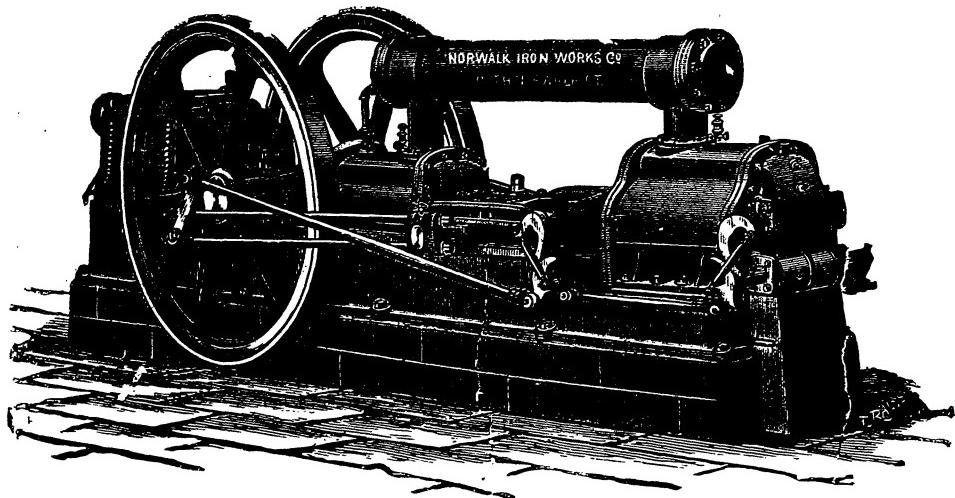
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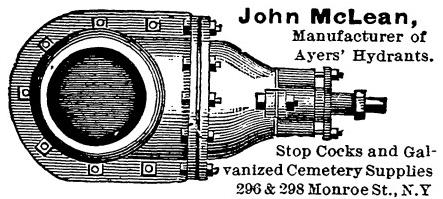
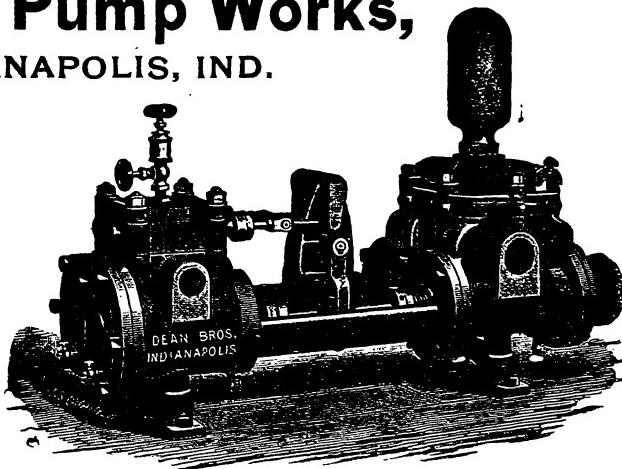
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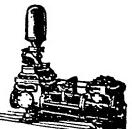
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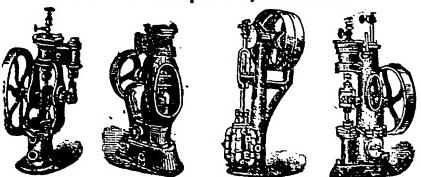
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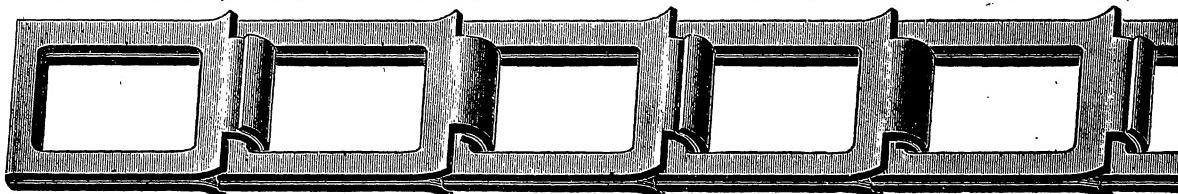
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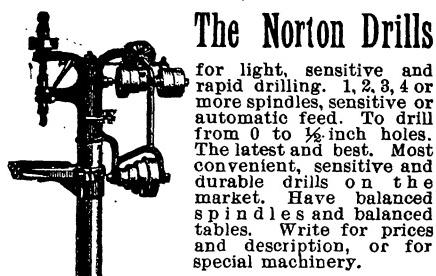


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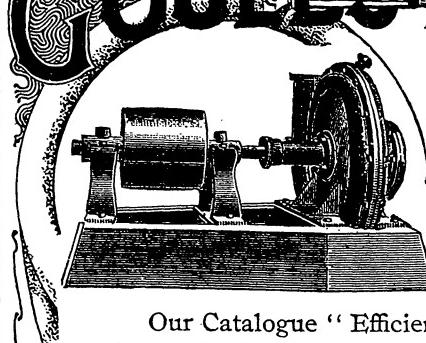
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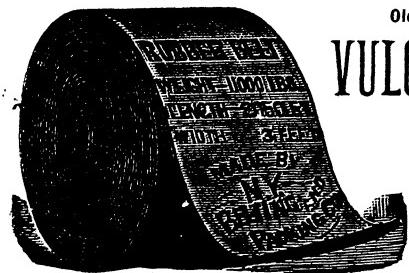
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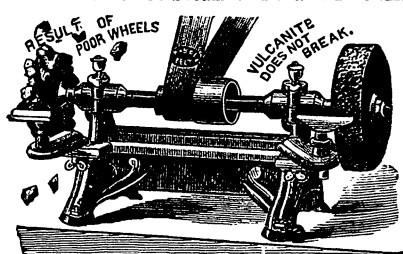
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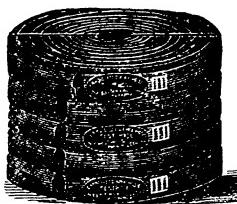
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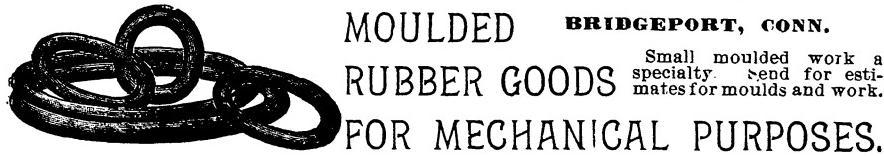
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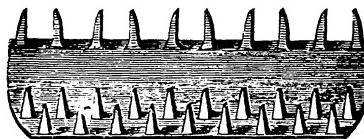
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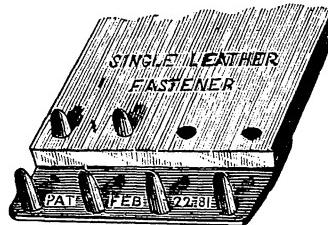
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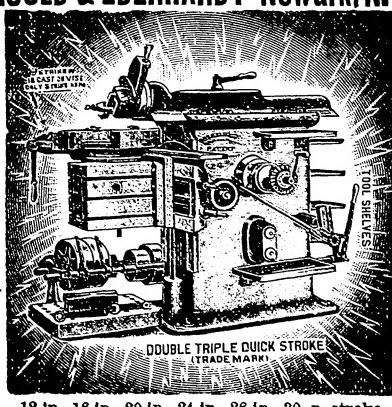
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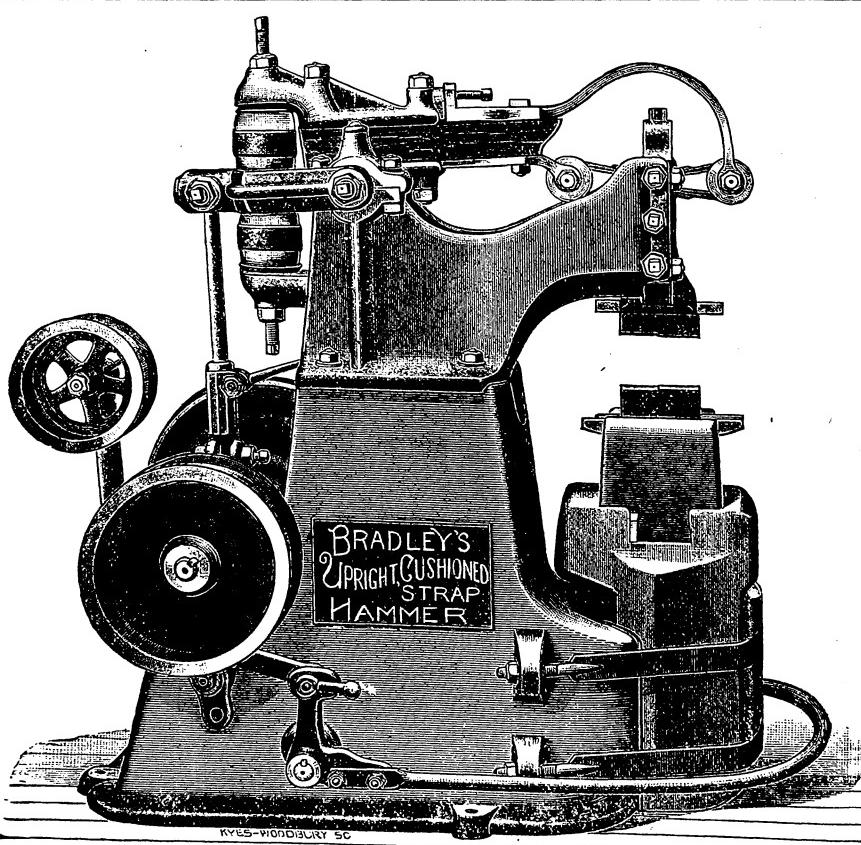
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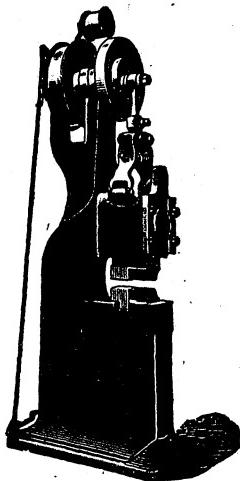
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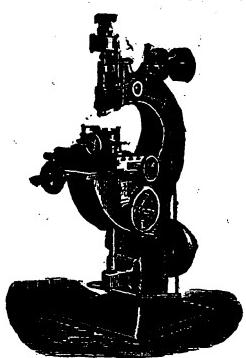
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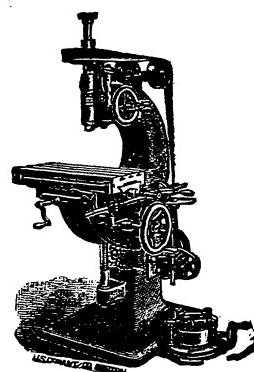
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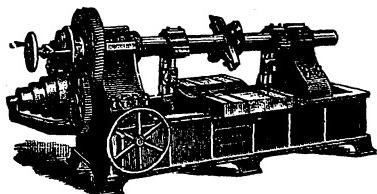
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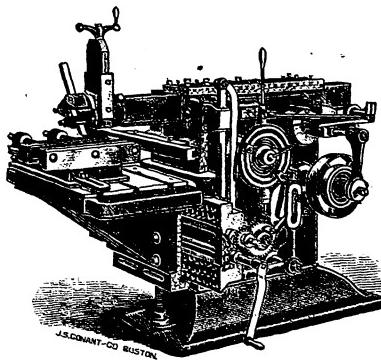
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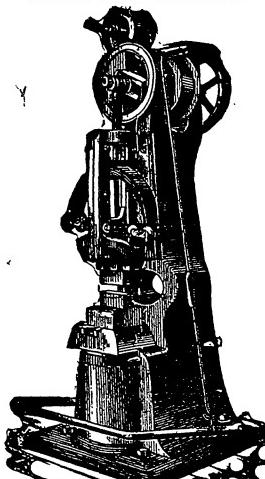
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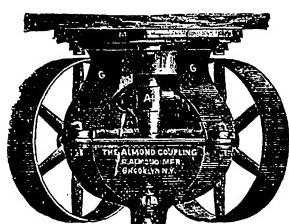
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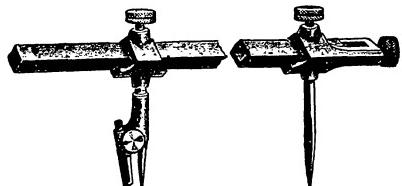


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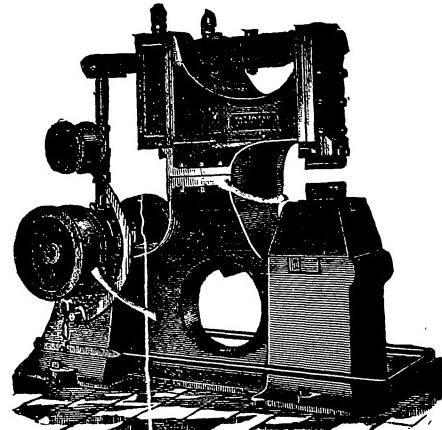
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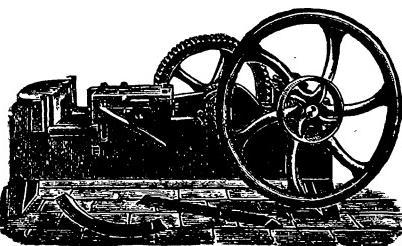
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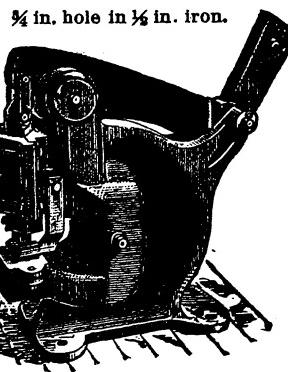
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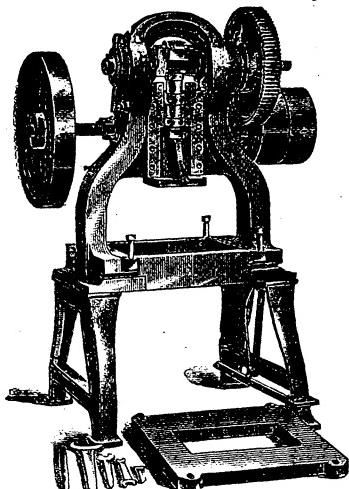
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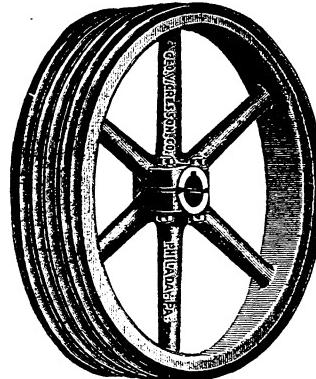
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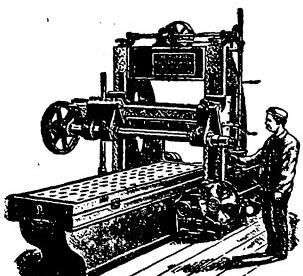
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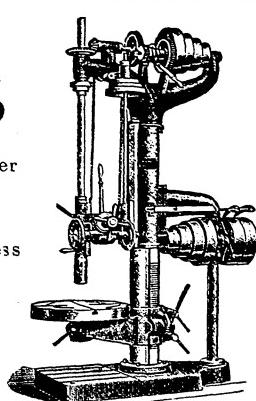
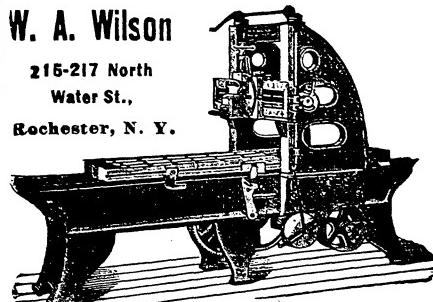
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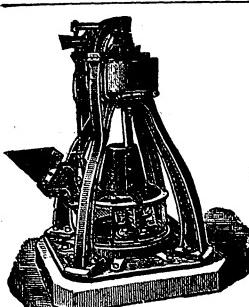
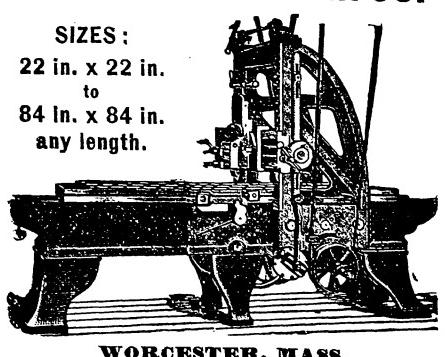
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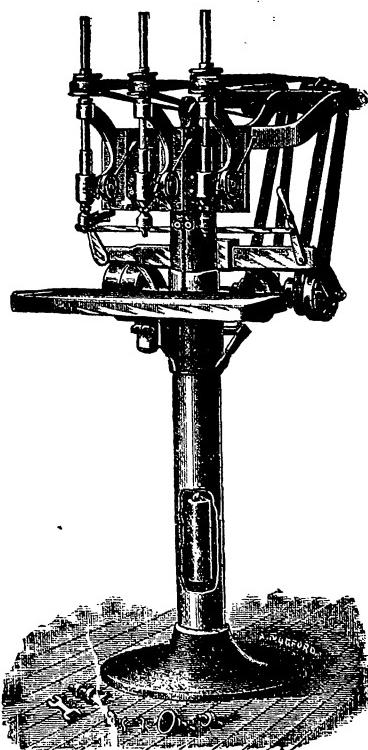
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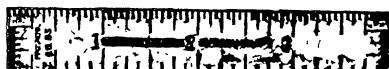
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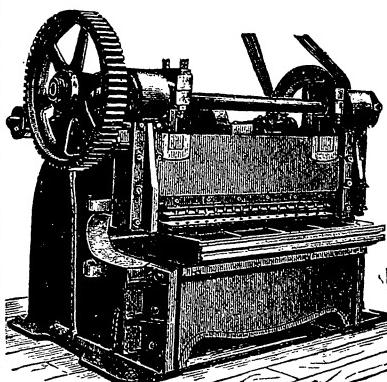


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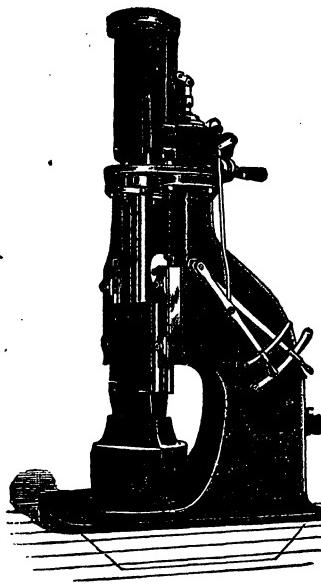
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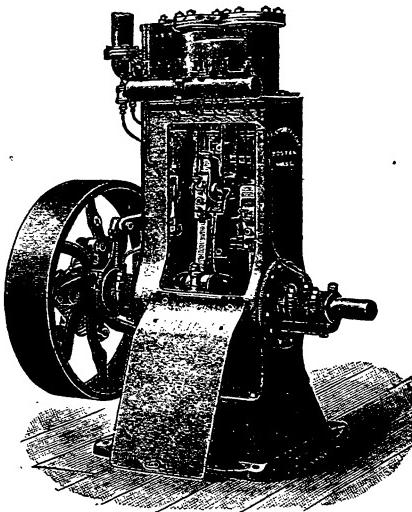
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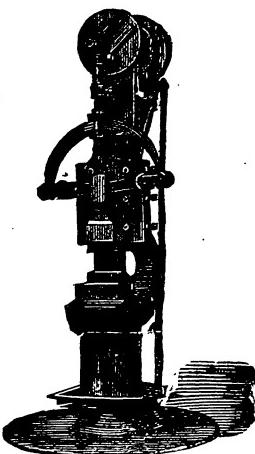
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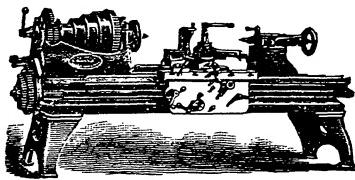
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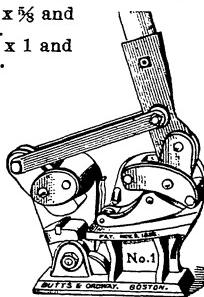
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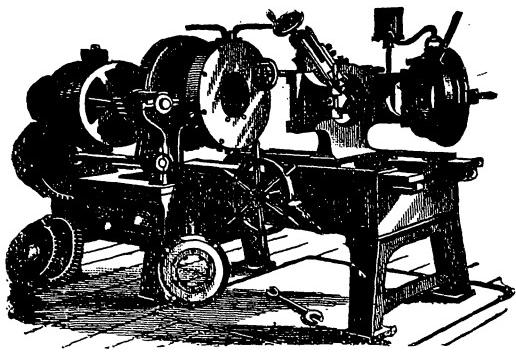
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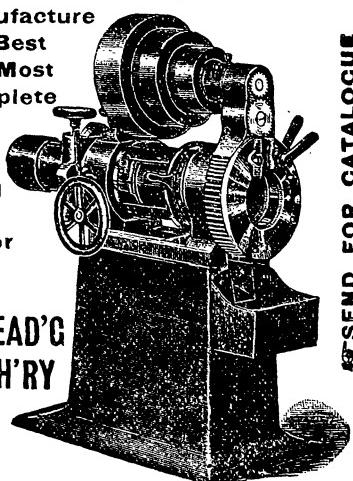
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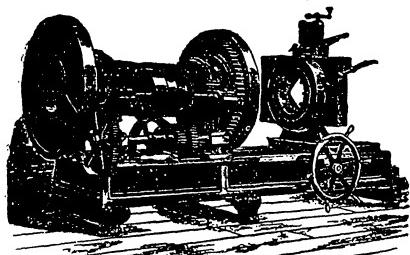
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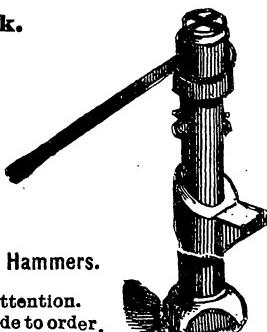
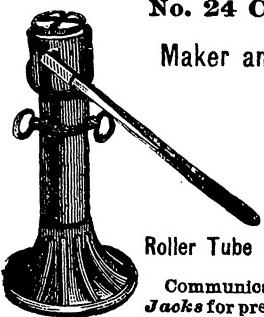
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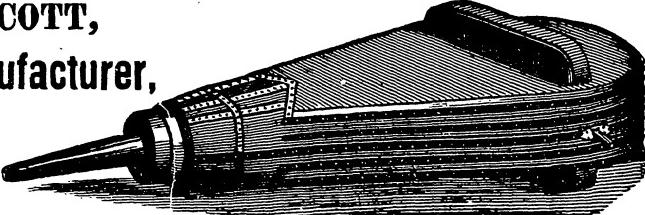
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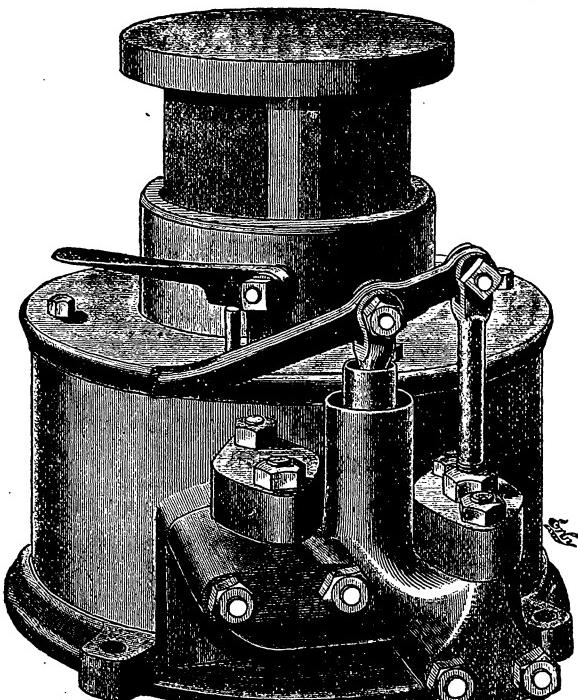
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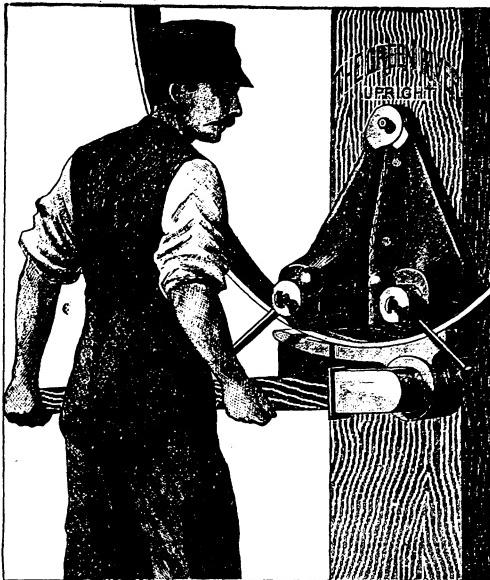
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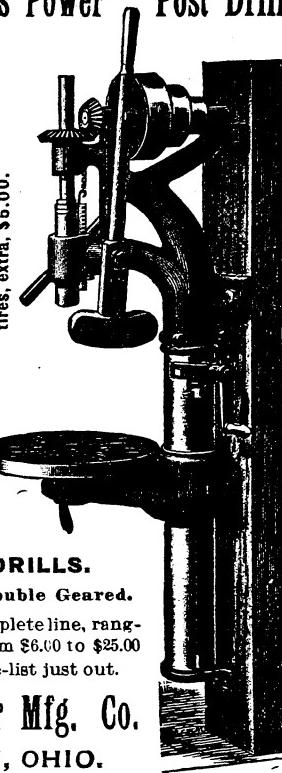


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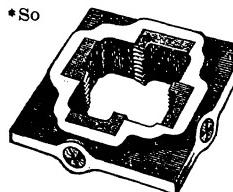
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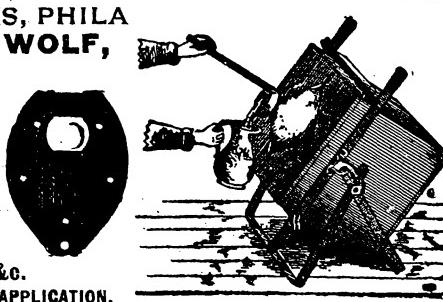
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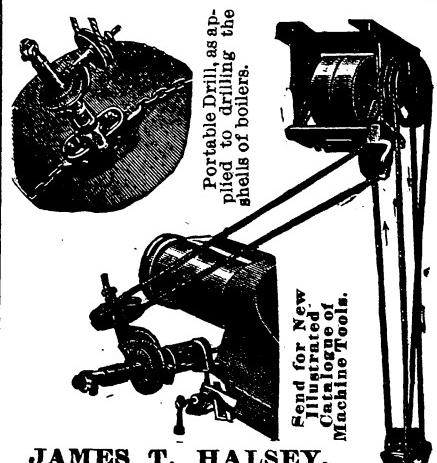


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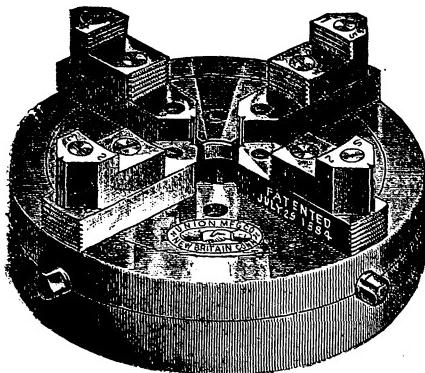
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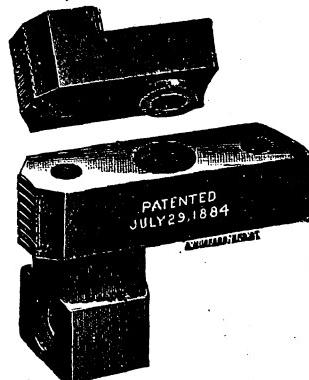
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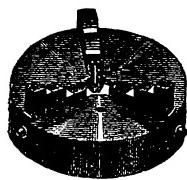
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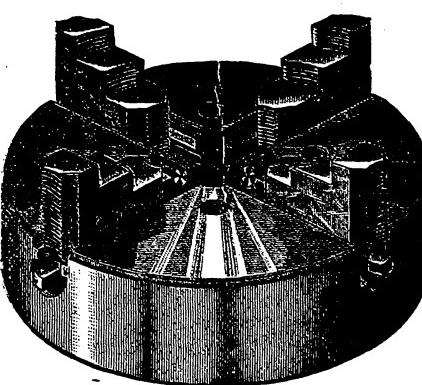
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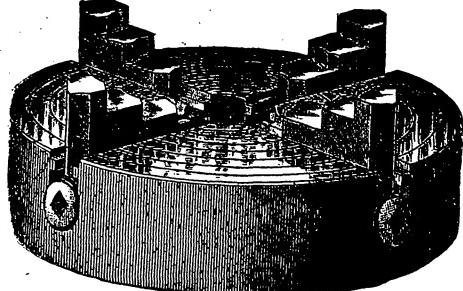
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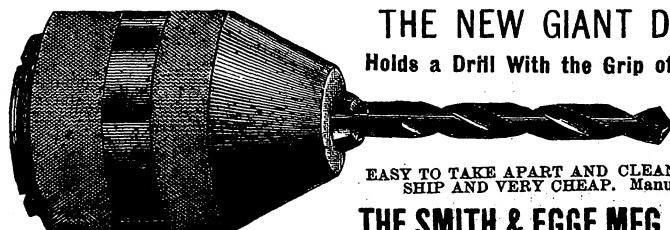
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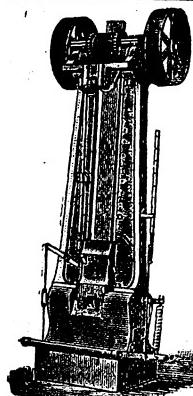
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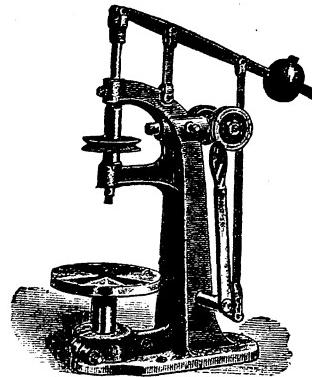
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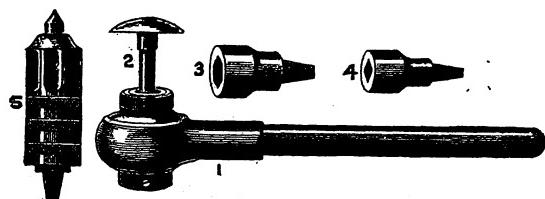
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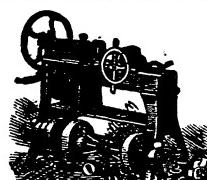
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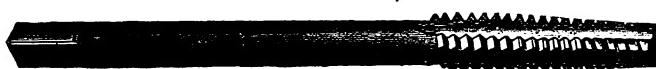
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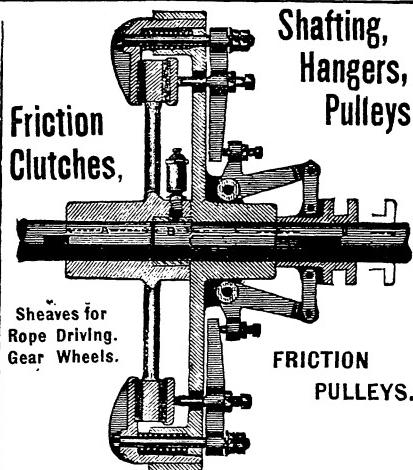
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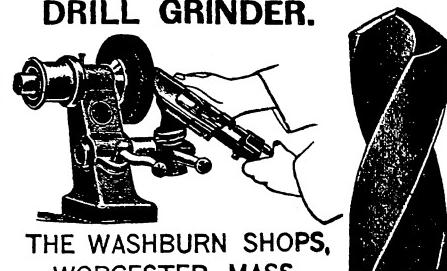
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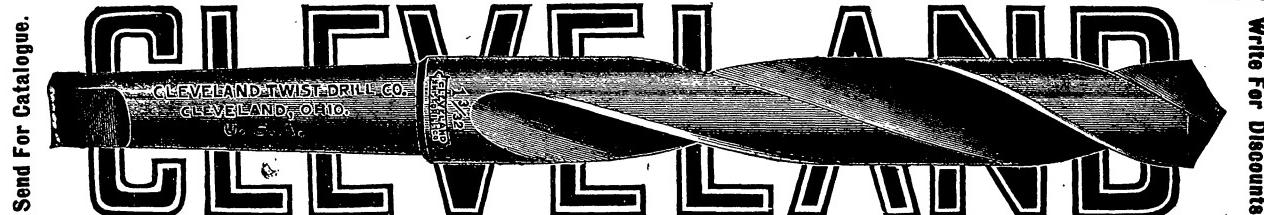
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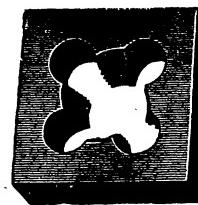
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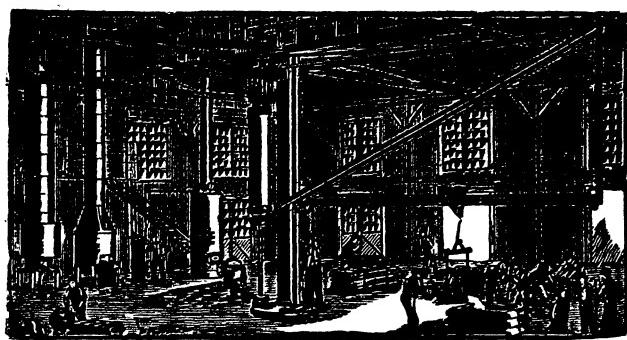
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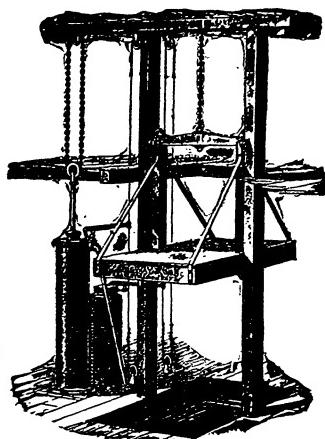


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#### CRANE CHAIN BREAKS WITH LADLE OF MOLTEN IRON.

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Enclosed find clipping from the Sharon, Pa., Telegraph, of June 24, giving an account of an accident at our works which fearfully demonstrates "The Unexpected in the Foundry." A sixty-ton heat was in progress of being run off and at the second lifting of the crane ladle, the hoisting chain parted, and let the ladle drop five feet, striking the side of the cupola's ladle pit, and throwing the metal over the body of George Miser. Though almost enveloped by seething fluid iron, he retained his senses, and while attempting to crawl out of the metal was grasped by two men, who were horrified to find his skin come off at every touch. The unfortunate man lived three hours. It is the first serious accident I have had under my management of heavy work, for 24 years in the foundry. It took two and a half hours to resume melting, and after running down what iron remained in the cupola, the bottom was dropped. The chain which broke was best English make, and tested to lift 20 tons with safety. Its load at the time of the accident was about five tons. This suggests the query, *Why do chains generally break with the lighter loads?* This, I think, is the experience of others as well as myself. Yours truly, THOS. D. WEST. Sharpsville, Pa., June 26, 1893.

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Does not require skilled labor to cut key way or fit key.

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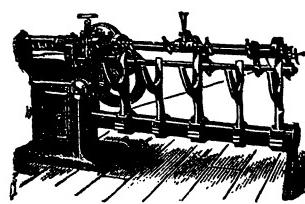
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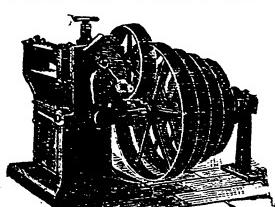
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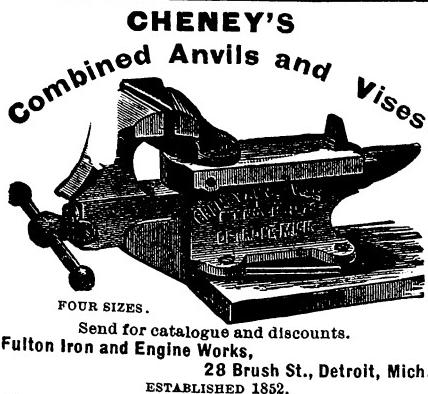
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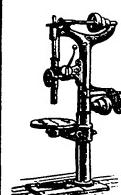


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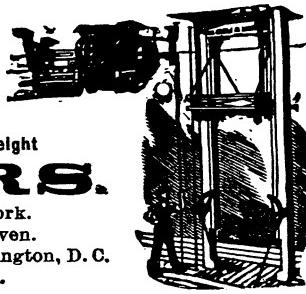
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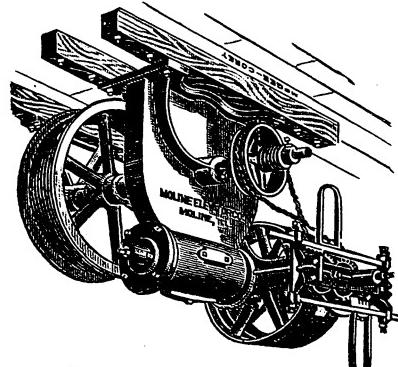
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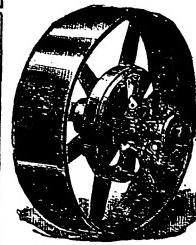
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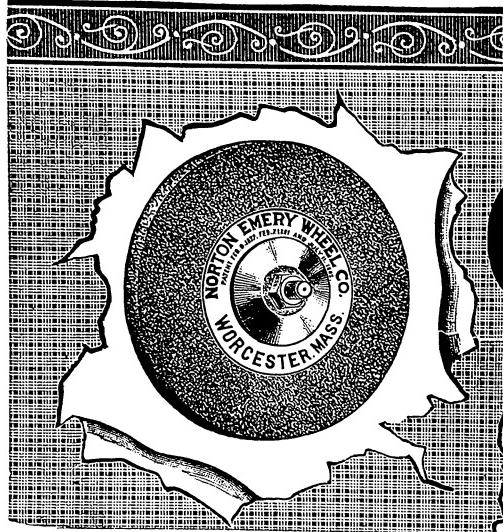
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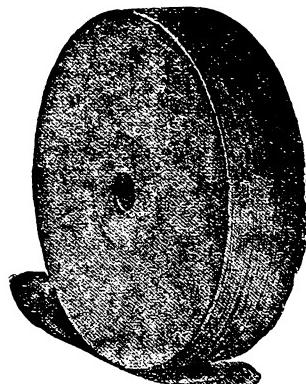


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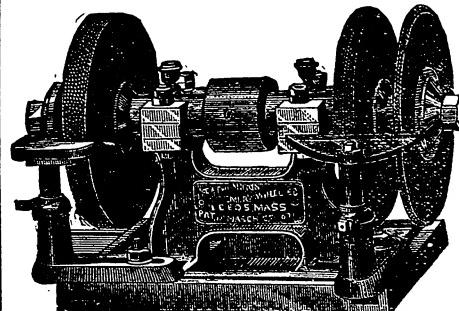
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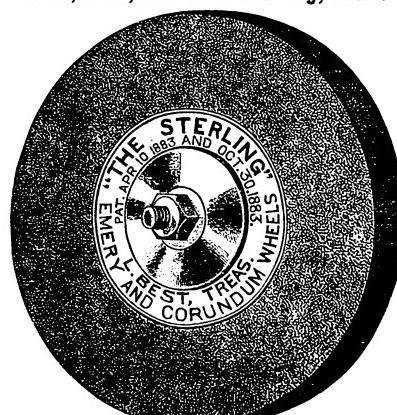
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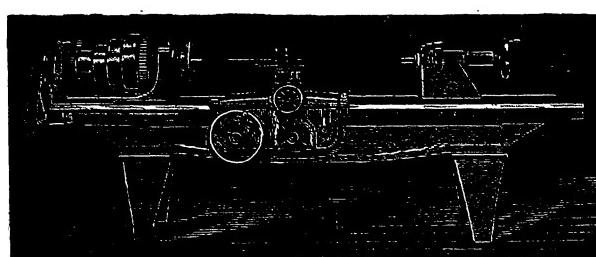
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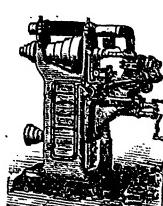
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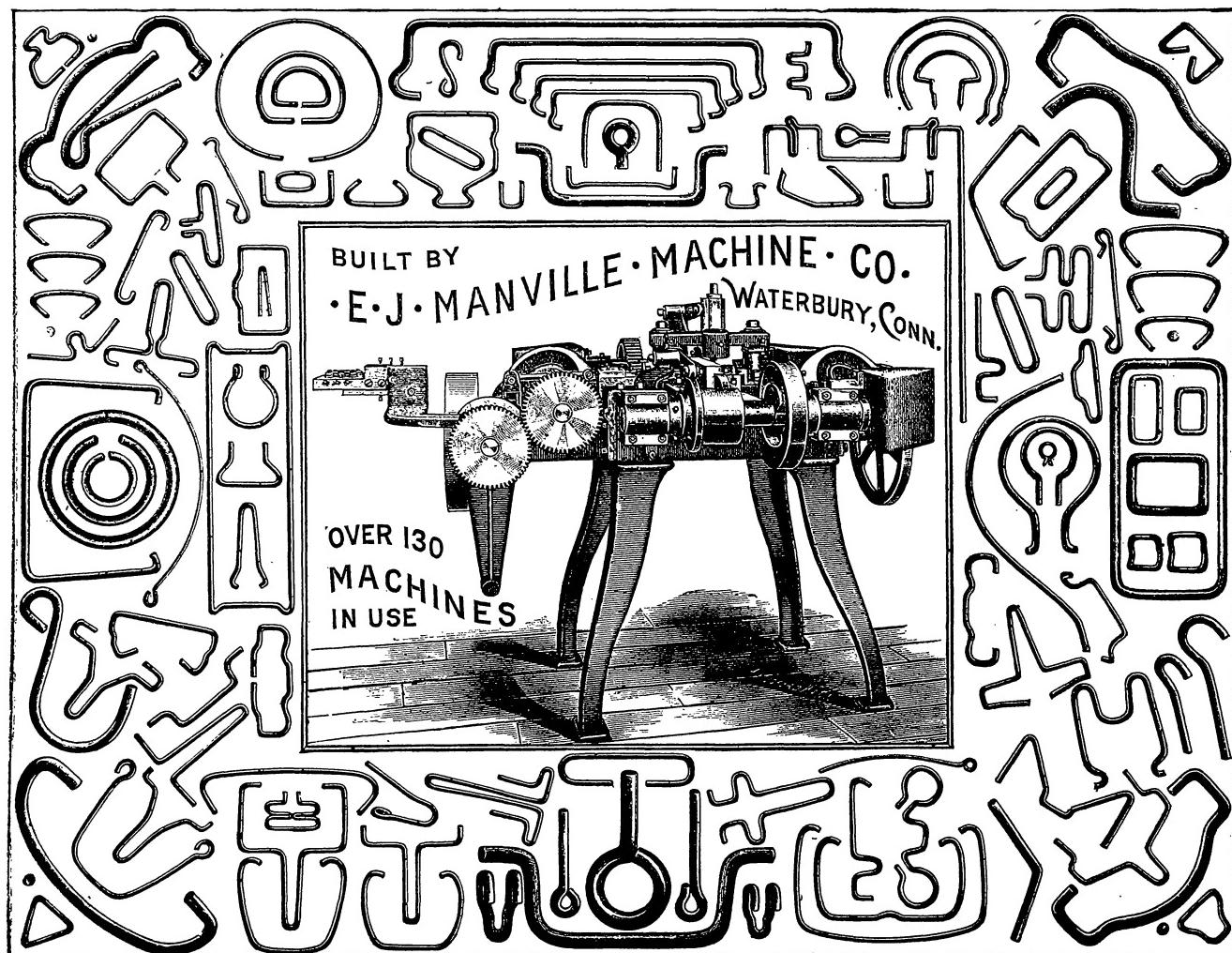
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Fitchburg Lathes, 14, 16, 18, 24, 30 and 36 in.  
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Improved " New Pattern, 24 in. swing.  
Powell Planers, 24, 30, 36 and 42 in. wide.  
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Radial Drills, " New Heavy Pattern" 3, 4 and 6 ft.  
Arms. Extra weight and power.  
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Bending Rolls, 8 and 10 ft. "Improved Style."  
Punch and Shear, 28 and 36 in. gap.  
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Hydraulic Riveter, 8 ft., with complete overhead  
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B. & S. No. 2 Vertical Turret Chucking Machine.  
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Call at our salesroom and inspect them, or write for  
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I offer 8 20 in. x 24 in. Improved Straight-line  
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Fitchburg Machine Co. Vertical Automatic  
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Pumps. F. McSWEAGAN & SONS,  
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14 in. x 6 ft. Fitchburg " " " "  
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16 in. x 6 ft. " " " "  
16 in. x 8 ft. " " " "  
16 in. x 8 ft. Flather " " " "  
16 in. x 8 ft. Dexter " " " "  
17 in. x 6 ft. Fitchburg " " " "  
17 in. x 8 ft. " " " "  
18 in. x 8 ft. " " " "  
19 in. x 8 ft. " " " "  
20 in. x 7 ft. Flather " " " "  
20 in. x 10 ft. Fitchb'g " " " "  
20 in. x 9 $\frac{1}{2}$  ft. Pond " " " "  
22 in. x 10 ft. Flather " " " "  
22 in. x 16 ft. Fitchb'g " " " "  
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28 in. x 26 in. x 10 ft. " " " "  
60 in. x 50 in. x 24 ft. " " " two heads  
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A good second-hand Roll Turning Lathe.  
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One Pond Machine Tool Co. Iron Planer, 40 in. x 40 in. x 24 ft., with two heads. In fine order.  
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10,000 tons Mill Cinder 54 per cent metallic iron; Philadelphia Delivery.  
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**Boring Mill,** 10 ft. 4 in. swing, 56 in. under cross rail, table 7 ft. 6 in. in diameter.  
**Boring Mill,** 8 ft. 4 in. swing, 48 in. under cross rail, table 6 ft. 6 in. in diameter, two heads on cross rail.  
**76-in. Planer,** 13 ft. long; heavy and powerful.  
**48-in. Car Wheel Borer.**  
**Axle Lathe.**

Write for photographs and further particulars.

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IN STOCK, LARGE LINE OF NEW AND SECOND-hand engines, boilers and machinist's tools for sale or exchange. Let me know your wants and what you have for sale or exchange. Below are some special bargains:  
100 H.-P. Corliss Engine, 60 H.-P. Atlas Automatic engine.  
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Hilling machines, gear cutters.  
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44 in. radial drill, 1 $\frac{1}{2}$  National bolt cutter.  
No. 3 Fowler press, 2 to 10 in. exhaust heads.  
25 lbs. Bradley and 10 lbs. Hotchkiss Hammers.  
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1. Hendey Shaper, 15 in. stroke, imp. vice; new.  
1 1/4 x 6 Screw Cutting Engine Lathe; new.  
4 H.-P. Comb. Engine and Boiler. Fine condition.  
Hendey Cutting-off Machine. New.  
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72 x 72 x 20 Planer. 2 Cross Heads.  
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Also variety of Engines, Boiler Pumps, &c.  
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Two WESTINGHOUSE ENGINES, 60 and 25 H.P.

**HORIZONTAL BOILERS,** 5 $\frac{1}{2}$  x 16, 5 $\frac{1}{2}$  x 14, 5 $\frac{1}{2}$  x 10, 5 x 18, 4 $\frac{1}{2}$  x 12, and others. Brennan Crusher, 8 x 25. Bogardus Mill. Ingersoll Rock Drill. Woodward Double Fire Pump, 1000 gallons. Worthington Duplex Pump, 25 x 12 x 24. Four-side Wood Planer and Matcher. Also assortment of Steam Pumps.

Send for catalogue.

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**BAKER BLOWERS,** Nos. 1, 4 $\frac{1}{2}$ , 5, 6 and 7.  
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1 Corliss Band Wheel, 12 ft. x 24 in. in halves.

A Variety of Machinery, Such as Boilers, Engines, Pumps, Crushers, &c., very cheap.

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For sale cheap. Made by Garrison & Co., Pittsburgh; complete and modern; 5 $\frac{1}{2}$  ft. high, flywheel 20 tons, 5 sets Bearings, pinions, rolls, bedplates, &c., in perfect condition. Address

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Hendey's "Morton" Screw Cutting Lathes. Cut 12 threads without changing any gears. 36 speeds for the side feed.  
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A line of second-hand Tools, also small Electric Fan Motors.

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A machine to perforate tin sheets for IC and IX tin, 14 in. x 20 in. or longer, perforating round holes from No. 1 to No. 7 inclusive. We will receive bids for a machine of the latest improved style, to perforate and finish such sheets. Or would like to hear from a man who can make such improved machine and can run the same. Address "PERFORATING," office of *The Iron Age*, 96-102 Reade St., N.Y.

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NEW AND SECOND-HAND, FOR SALE.****LATHES.**

50 in. x 18½ ft., Geared Face Plate.	25 in. x 12, 16, 20 and 24 ft.
40 in. x 45 ft., " " " Double Lathe, complete.	22 in. x 10 ft.
52 in. x 35 ft., Rod Feed only; one end has Hor. Boring Machine.	21 in. x 8, 10 and 12 ft.
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38 in. x 27 ft.	17 in. x 6 and 7 ft.
30 in. x 28 ft., Shafting Lathe, Pond.	16 in. x 6 and 8 ft.
28 in. x 22 ft., cheap.	14 in. x 6 ft.
24 in. x 10 ft., "	12 in. x 5 ft.

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5 ft. x 22 in.	12 ft. x 60 in., 2 heads.	22 ft. x 72 in., 4 heads.
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5 ft. x 26 in.	15, 20, 26 in. stroke Shapers,	8 ft. x 31 in.
7 ft. x 26 in.	22 ft. x 62 in., 2 heads.	12 ft. x 36 in.
8 ft. x 31 in.	22 ft. x 72 in., 2 heads.	13 in. stroke Slot-ters.
12 ft. x 36 in.	22 ft. x 72 in., 2 heads.	

Lincoln Millers Gang Drills, Screw Machines. Steam Hammers, 1000 and 3000 lbs. Drill Presses, 20, 24, 28, 30, 44 in. Upright. Gear Molding Machine, Scott's Pat., 3 different sizes. Corliss Engines, 12 in. x 24 in. and 16 in. x 22 in. Brown Engine, 16 in. x 48 in. Whitehill, 11 in. x 18 in. Vertical Engine, 13 in. x 16 in., N. Y. Safety Steam Power Co. Send for latest list.

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Four second-hand 75 H.-P. Double-Deck Boilers, with all fittings and fixtures. In first-class condition. Cheap.

Two 2-flue Boilers, 48 in. diam. x 32 ft. long, in prime condition. Cheap.

One 16 x 22 Side Crank Engine.

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Full line of new and second-hand Boilers and Engines always on hand.

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**Relaying Rails and Narrow-Gauge Equipment and large quantities of Light New Steel Tee Rails.****FOR SALE CHEAP.**

100 tons of "I" Beams, new, 7 to 15 in. and 15 to 28 ft. long.

I am in the market at all times to buy or sell anything in the way of second-hand Equipment, Rails and Scrap. In answering, kindly mention paper.

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**STEAM PUMPS FOR SALE.**

We have on hand  
One new Worthington Pump, 7½ x 4½ x 10.  
Also two second-hand Pumps, in good order.  
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25 lb. section iron T Rails in good condition for relaying.

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**Locomotive Boilers,**

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Full line of Engines and Pumps, guaranteed first class. It will pay you to see our stock before buying.

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43 Engines, 26 inch diameter and smaller.  
16 Hoisting Engines.  
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4 Ore Grinding Pans.

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Write us for Bargains.

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Manufacturing Property.

Having purchased the Auburn Manufacturing Company's plant, with greater facilities for manufacturing carriage forgings which my increasing trade demands, I offer my former plant for sale or rent, which consists of two-story stone and wood building, 60 x 30, and three-story stone and brick building, 75 x 40. Also forge shop, 22 ft. posts, 150 x 54, with large double windows between each bent. 50 x 30 boiler house. Splendid water power, 11 ft. head. One 64-in. American Turbine. One 24-in. Little Giant Turbine. 200 ft. 2½ Cold Rolled Iron Shafting. 40 ft. 2½ Cold Rolled Iron Shafting. 60 ft. 2-in. Cold Rolled Iron Shafting. Furnished with self-oiling boxes. Water wheel governor; 4-ton Buffalo Scales. The premises cover about 2½ acres. Shipping facilities of the best. Located near N. Y. Central and Philadelphia and Reading depots. Will be sold cheap and on easy terms or rented. For particulars address

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**FOR SALE.**

50 Cast Iron Lamp Posts, fancy, 800 ft. Wrought Iron Fence, 3 ft. high, scroll work.

150 Lathe Drip Pans for oil and turnings.  
14 Casting Rumblers and gearing.  
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1 Pulley Grinding Machine.  
1 Rack for storing new iron.  
1 30-in. Cement Foundry Cupola.  
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Power Trip Hammers, Lathes, Milling Machines. Prices to suit buyer.

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**A 16-inch SHAPER.**

Makers: Gould & Eberhardt. Splendid condition; low price; good value.

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Used but a short time.

A splendid tool.

A good purchase.

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31 four-wheel, 5-ton Lime Cars, cheap. Address

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No. 14, 16, 1, 6 and 7 Root's Pressure Blowers, in Al order and cheap.

Also 15 horse-power Greenfield Upright Engine, good as new.

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163 and 165 Washington St., New York.

# Assignee's Sale.

**ASSIGNEE'S SALE.**—The undersigned, Assignee of the Roelker Stove and Plow Co., of Evansville, Indiana, by order of the Superior Court of Vanderburgh County, Indiana, will, on the SIXTH DAY OF SEPTEMBER, 1893, on the premises of said company, on Main and Sycamore streets, between Fifth and Sixth streets, commencing at 10 o'clock a.m., and continuing until all said property is disposed of, sell all the real and personal property of said corporation, consisting of plows, stoves, castings, patterns, flasks, tinner's stock, raw material for the manufacture of stoves and plows; also all tools and machinery used in the manufactory. The above property will be sold for CASH.

The property to be sold is one of the best equipped plants for the manufacture of stoves and plows in the West. The buildings have been erected and machinery placed with especial reference to the business, and everything is in perfect condition to continue the business.

The Roelker Stove and Plow Co. is widely and favorably known and its stoves and plows are in great demand—a purchaser could not only purchase a thoroughly equipped plant, but could also secure the good will of a thoroughly advertised business of thirty-eight (38) years' active operation. The property will be sold at public auction to the highest bidder. If purchaser cannot be found for the entire plant, then it will be divided and sold in such quantity as may secure the best returns.

No better opportunity was ever offered for a profitable investment.

In the meantime propositions will be received for private sale of all or part of above described real estate, and also for either or both the stove and plow manufacturing business, with all its manufactured stock, raw material, patterns, machinery, tools, &c., connected with the above-named business. Address

JOHN H. POLSDORFER,  
Assignee,  
Evansville, Ind.

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The "Electric" trains of the Cincinnati, Hamilton & Dayton R. & "Monon" Route between Cincinnati and Chicago are provided with the latest product of the Pullman Co. built expressly for this service. There are 10 compartments in each car, which may be converted at will into complete drawing rooms, most beautifully and harmoniously decorated, lighted by the Pintsch gas system, and are positively the most modernly equipped sleeping cars in the world. This is the only line running Pullman Vestibule and Dining Cars between the cities named. THE World's Fair Route. See that your ticket reads C. H. & D. and Monon Route.

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## Any Manufacturer

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E. J. HUSSEY & CO.,

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We are centrally located, active workers and can furnish best of references.

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For 50c. I will send you a pamphlet containing 50 well written advertisements, each of which is worth easily \$2.00. If you want to catch the trade of your town send 50c. in stamps and get pamphlet by return mail.

Thousands already in use.

J. A. DUFFY, - 118 Main St., Hannibal, Mo.

## AUDITOR'S NOTICE.

Assigned Estate of the Bristol Rolling Mill Company.

The undersigned Auditor, appointed by the Court of Common Pleas of Bucks County for the purpose of passing upon the exceptions to the account of, and making distribution of the fund in the hands of A. Weir Gilkeson, Assignee in trust for the benefit of the creditors of The Bristol Rolling Mill Company, hereby gives notice that he will meet all parties interested at his office, in the borough of Doylestown, Pa., on Thursday, the 3d day of August, A.D. 1893, at 10 o'clock a.m., for the purpose of attending to the duties of his appointment. Creditors will please send statements of their claims to the undersigned.

HENRY O. HARRIS, Auditor,  
Doylestown, Pa.

## FOR SALE TO CLOSE AN ESTATE.

Fine Hardware, Stove, Tinware and Plumbing Business.

In a growing Western town; doing a first-class retail and jobbing business. Stock will inventory about \$35,000. A rare chance, as present owners have been liberal advertisers. Only those who mean business need apply. Address "M. & M." office of *The Iron Age*, 96-102 Reade St., N. Y.

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Successors to  
HAYDOCK & BISSELL,  
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Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

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Make the same entry but once. A Ledger in place of a full set of books. Convenient forms for all entries. Easily applied, simple, saves time. West's Self-Proving Balance locates every error. Send 3 cent Stamps for illustrated 16-page pamphlet.

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I make a special business of buying and selling Job Lots of

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Tools and Second Quality Files a Specialty.  
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Largest wholesale house in America for Mirrors of all kinds, Pictures, Mouldings, Frames, Brackets, Easels, Screens and kindred goods. Large illustrated catalogue sent to Dealers upon application.

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To furnish reasonable estimates on specialties in light metal work.

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Or to lease for a term of years in the City of Brooklyn. Business in existence over 30 years. Recent death of former occupant the cause. Apply to THERESA HAAS, care of G. KERK, 62 and 64 William St., N. Y.

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FOR MAKING CHAMFERED AND TRIMMED NUTS.

Correspondence solicited.



The Scattergood

Time Record and

Pay Roll Book.

(Pat. Oct. 13, 1891.)

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or if you are a dealer and want an Agency send for our Catalogue and Price-List.

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## NEW ENGINE LATHES For Sale Cheap.

13 in.

15 "

17 "

20 "

22 "

ANY LENGTH  
OF BED.

Draper Machine Tool Co.,

Successors to

LATHE & MORSE TOOL CO.,

WORCESTER, MASS.

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Vertical pattern, with balanced steam slide valve gear, steam cylinder 14 in. diameter, air cylinder 40 in. diameter, stroke 24 in. 1 to 100 strokes per minute; engine new.

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**SALESMAN** for Household Specialties as a side line on commission; sells to hardware trade and general stores; sells readily and not bulky. Call or address CHICAGO HARDWARE SPECIALTY CO., 47 and 49 Lake St., Chicago.

**AN EXPERIENCED MANAGER** for an old established iron and steel works, located within 150 miles of New York City. Address "C. K." No. 727, office of *The Iron Age*, 96-102 Reade St., New York.

**BUSINESS MANAGER** for a manufacturing company, employing several hundred men on fine machinery, such as small arms and sewing machines; must be a thorough mechanic as well; good salary will be paid to one who has made a record. Address "DUPLEX," office of *The Iron Age*, 96-102 Reade St., New York.

**AN ENERGETIC MAN** as foreman in brass foundry employing about 100 men; must be experienced in valve work, also steam and water goods; must be able to turn out work at bottom prices. To such a man steady work and good wages will be paid. Address, stating experience, P. O. Box 1409, New York City.

**A MANUFACTURER** of Cutlery Specialties desires to place his samples in the hands of a first-class salesman having large acquaintance with retail trade of New York State. Standard goods. Liberal commission. Address "CUTLERY SPECIALTIES," office of *The Iron Age*, 96-102 Reade St., New York.

**EXPERIENCED SALESMAN** on liberal commission for Ohio, Indiana, Illinois and Michigan, to sell a line of extra finished hollow ware from factory. Address HEESEN BROS. & CO., Tecumseh, Mich.

**A YOUNG MAN** of good character and habits as bill clerk and assistant book-keeper in a New York hardware house. Address, stating age, references and salary expected. "BILL CLERK," office of *The Iron Age*, 96-102 Reade St., New York.

**A FIRST-CLASS** blast furnace Manager; one who has had experience and can figure close; sober, industrious and honest; state wages desired, where employed; furnaces modern, located in the West and running steady. Address "BLAST FURNACE," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

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*Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.*

**BY NOVEMBER 1st** a position with some large manufacturing company or wholesale hardware house as general manager or financier; have a practical experience of 15 years as buyer and correspondent, handling a large and complicated mail; original and rapid letter writer; understand compiling price-list; posted in all kinds of sheet metal and general hardware in all details, figuring detail, cost of sheets and all complications in stock companies and very close applicant to business, and an indefatigable worker; I desire correspondence with those wanting a practical all-round man to fill a position of highest trust; satisfactory references and bond. "S. E. B.," office of *The Iron Age*, 96-102 Reade St., New York.

**STENOGRAPHER**; by a young man with two years' experience; can furnish first-class city references, and would have no objection to leaving the city for a permanent position. Prefer the iron business, as my experience has been mostly in that line. Address "AMERICAN," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

**THE FOREMANSHIP** of a gray iron foundry, by a thoroughly competent man; 18 years at the business; 6 years as foreman; am accustomed to heavy and light work in loam, dry and greens and handling men, mixing irons, melting economically with coke or coal; temperate in habits; good references. Address "GRAY IRON," No. 727, office of *The Iron Age*, 96-102 Reade St., New York.

**SEPTEMBER 1st**, situation with jobbing house, by a young man of five years' experience; am thoroughly posted on hardware values, and would like a place where such knowledge is necessary: can furnish excellent references. Address "PRICER," office of *The Iron Age*, 59 Dearborn St., Chicago.

**HARDWARE**, Shelf and Heavy; 18 years' experience as salesman, buyer and manager; will be open for engagement January 1st, 1894, or can arrange to engage before if desired; All references; good habits, and reliable. Address "S. AND H. HARDWARE," office of *The Iron Age*, 59 Dearborn St., Chicago.

**A SUCCESSFUL SALESMAN**, 40; highest references; thoroughly posted; well and favorably known to the hardware trade, users of iron and steel, nails and wire, and makers of agricultural machinery throughout the West, North and Southwest; desirous of representing, in Chicago and Western territory, manufacturers in above lines; correspondence solicited. Address "EXPERIENCE," office of *The Iron Age*, 59 Dearborn St., Chicago.

**TRAVELING MAN**, five years' acquaintance with wholesale hardware and woodenware trade east of the Missouri River, desires two or three staple lines on salary or commission; New York agency preferred; unquestionable references. Address "DANFORTH," office of *The Iron Age*, 96-102 Reade St., New York.

**BOOKKEEPER**.—An A1 bookkeeper and office man desires a position with hardware house, either wholesale or retail; fully competent to take charge of any set of books, correspondence or credits, etc.; long experience; highest efficiency; sober and trustworthy. Address "Books," office of *The Iron Age*, 96-102 Reade St., New York.

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**DRUMMER**.—Experienced traveling salesman, with extensive acquaintance in Texas, is open for an engagement with some hardware house; am thoroughly posted in all branches of hardware, tin-plate, sheet iron, etc.; capable, sober and reliable. Address "DRUMMER," office of *The Iron Age*, 96-102 Reade St., New York.

**SUPERINTENDENT** of a large manufacturing concern, employing over 300 hands, desires to make a change; thoroughly familiar with the manufacture of all kinds of brass and iron goods, plumbers' supplies, hardware and stoves; well up in modern methods of economical production of work; have had long experience in handling help; age 36. Address "OHIO," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, Ohio.

**A MAN** now occupying similar position would like situation as resident Manager or Superintendent; country preferred; is familiar with steam and water power, general machinery and management of help; large salary not so much an object as permanent, healthful location; best references as to ability and integrity. Address HENRY W. SCHOFIELD, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY A BUSINESS MAN** of 37, a resident of Chicago, a position as Representative or Selling Agent in that city and through the Northwest for steel, iron and tin plate product; has had considerable experience in securing large contracts and is right in touch with the best trade; can give either Eastern or Western references. "C. M. P.," P. O. Box 3254, New York.

**AS TRAVELING SALESMAN**; with a thorough practical knowledge of carriage hardware, having had ten years' experience on the road in England representing a full line of carriage axles, springs, iron and steel, and general hardware goods; age 32 years; best of references. Address "CARRIAGE HARDWARE," office of *The Iron Age*, 96-102 Reade street, N. Y.

**CHEMIST**.—A position with an iron company; thoroughly experienced in the analysis of iron ores, pig iron and steel; good references. Address "SILICON," office of *The Iron Age*, 96-102 Reade St., New York.

**BLAST FURNACE MANAGER** desires an engagement; competent and experienced in construction and operation; familiar with various ores and fuels and all mechanical as well as metallurgical details, practically as well as theoretically. Address "C. AND O.," No. 713, office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY COMPETENT MAN** with large trade and extended acquaintance, position to represent or travel for a mill making bar, sheets, billets, etc. Address "COMMERCE," office of *The Iron Age*, 220 South 4th St., Philadelphia.

**AS MANAGER** or Assistant in open hearth steel works or steel foundry; 20 years' experience in manufacturing steel of all grades and furnace and general rolling mill construction; understand making soft, sound steel castings and manganese steel; best of references. Address "SOFT CASTINGS," office of *The Iron Age*, 59 Dearborn St., Chicago, Ill.

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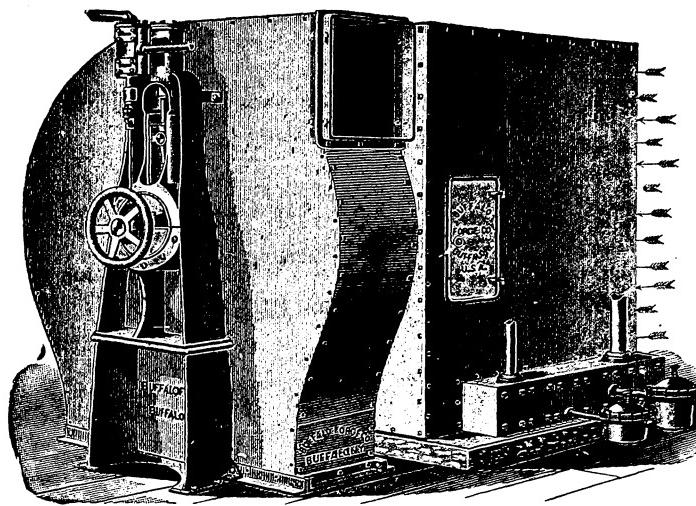
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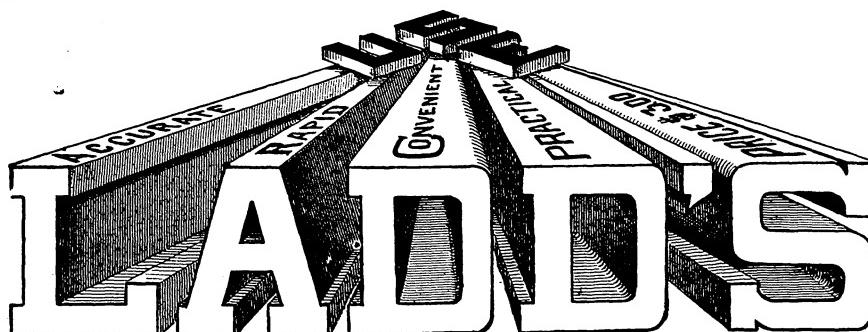
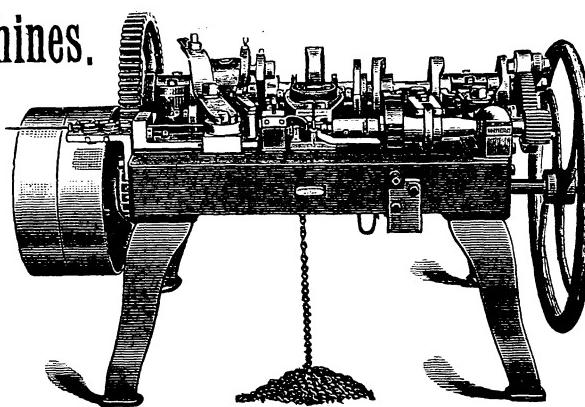
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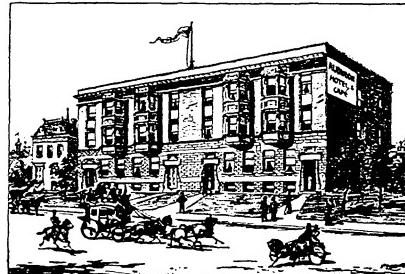
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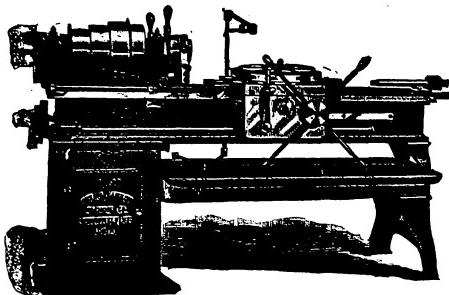
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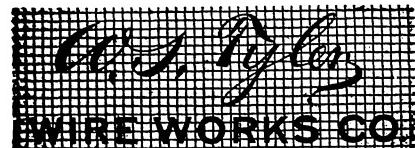
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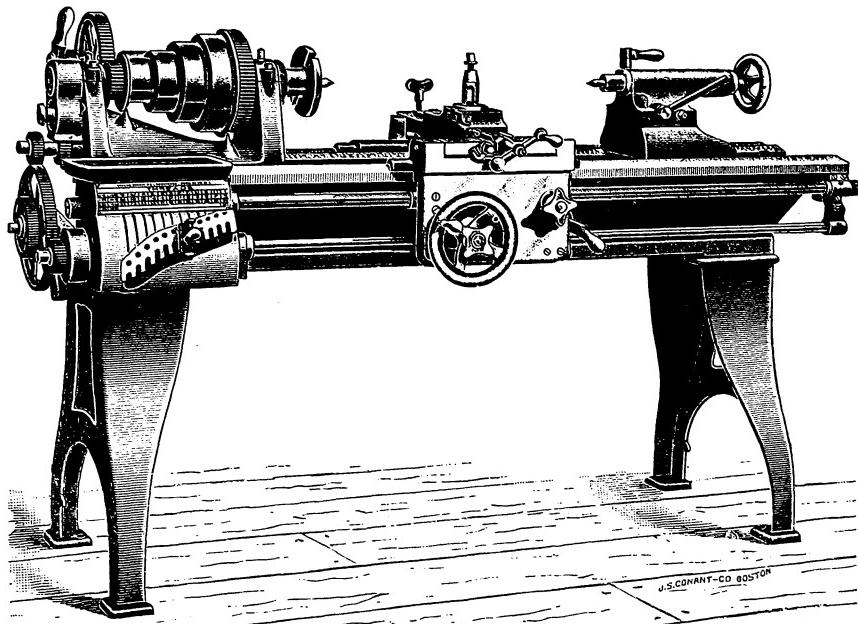
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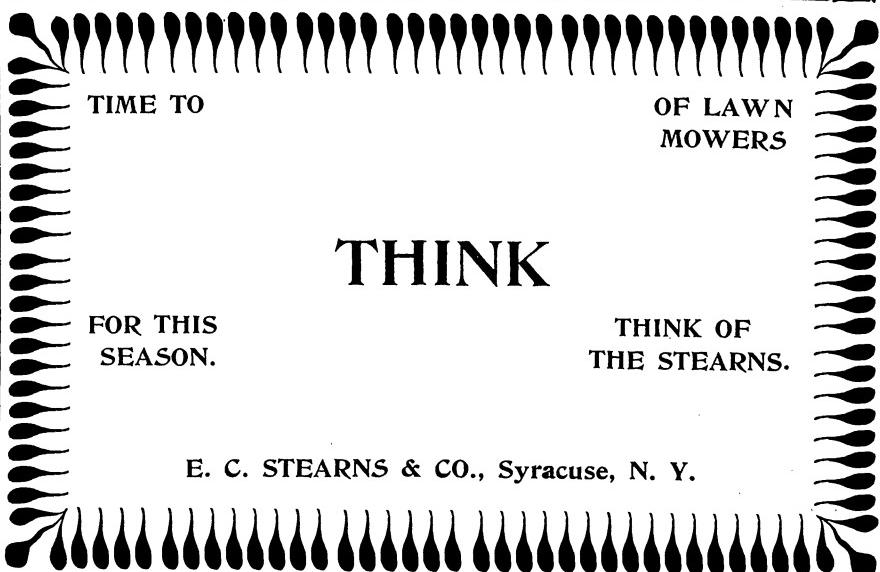
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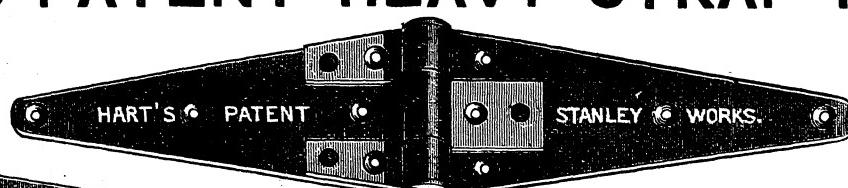
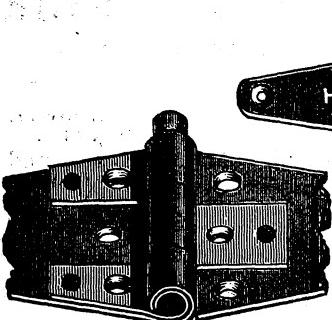
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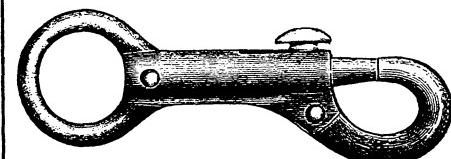
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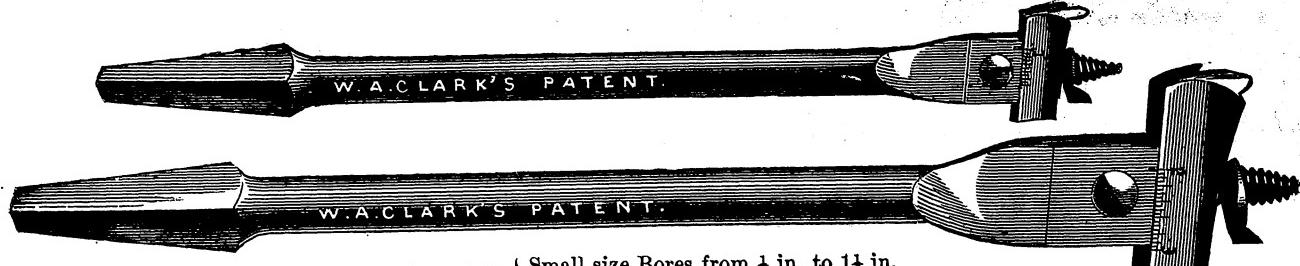
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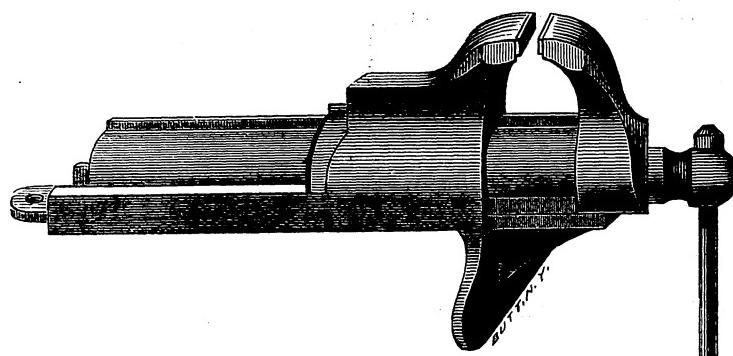


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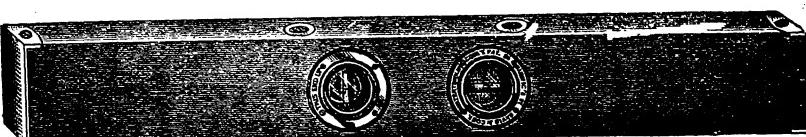
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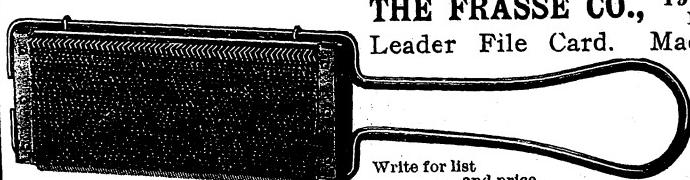


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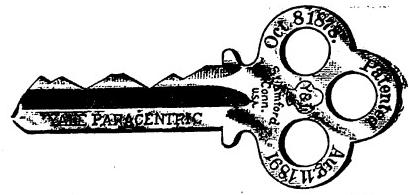
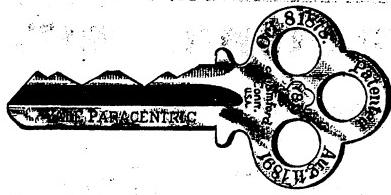
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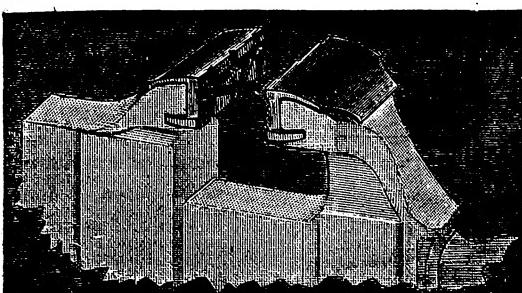
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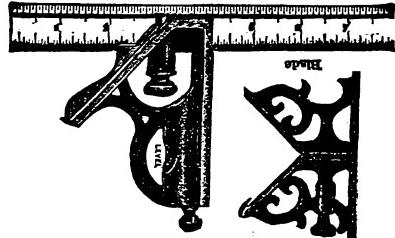
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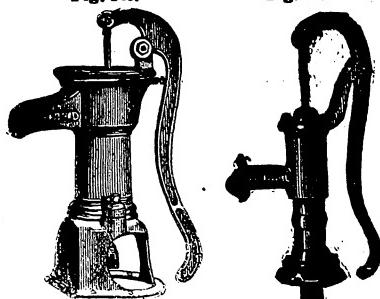
### DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY, AND EASY WORKING PUMP FOR

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Fig. 190.

Fig. 76.



or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand) and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

Capacity from 3,000 to 4,500 gallons per hour.

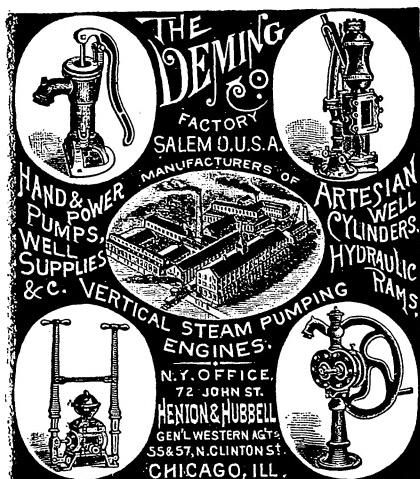
These pumps are simple, durable and low priced.  
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Fig. 209.

Fig. 381



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Are made from  
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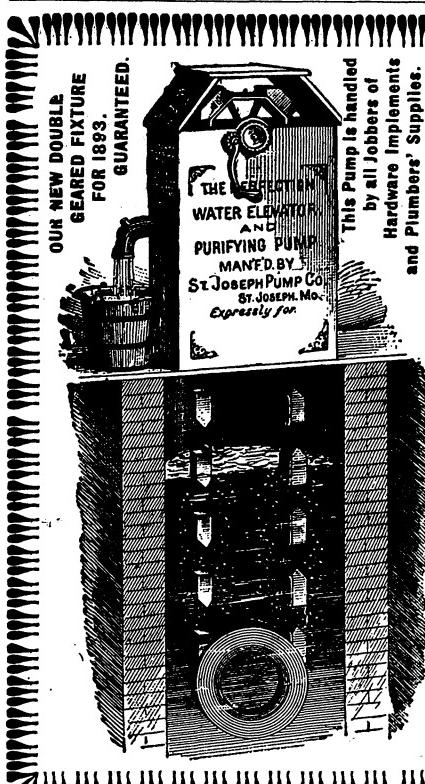
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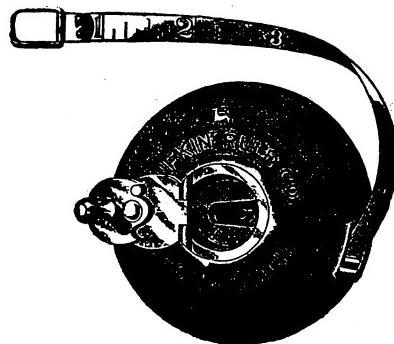
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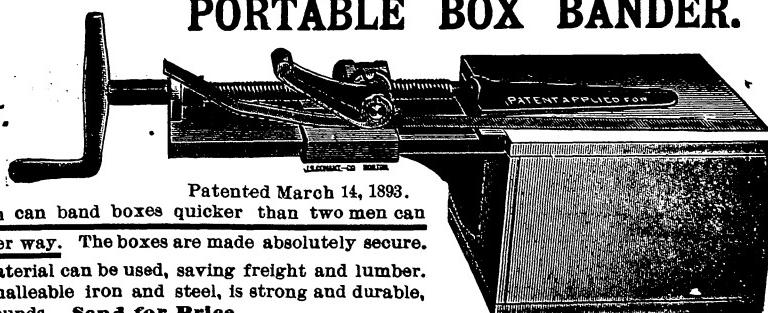
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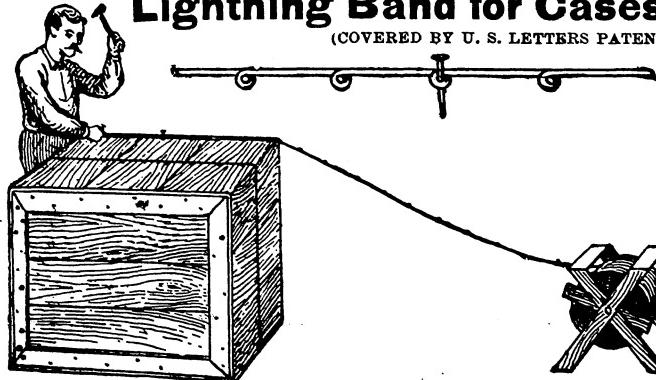


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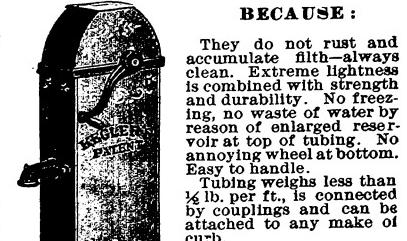
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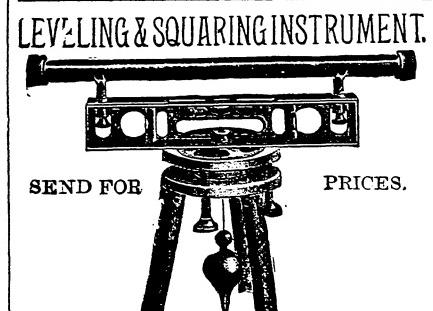


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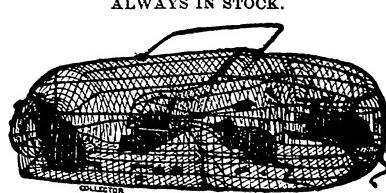


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and  
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OF  
THE

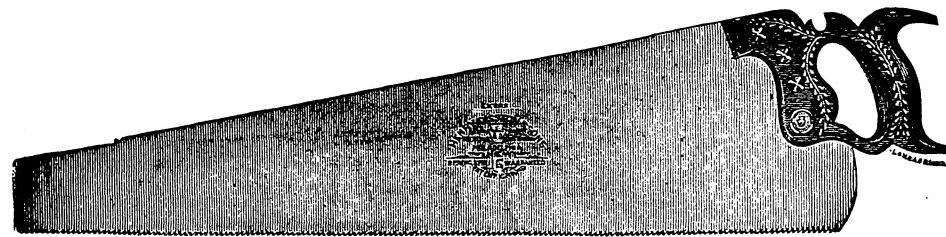
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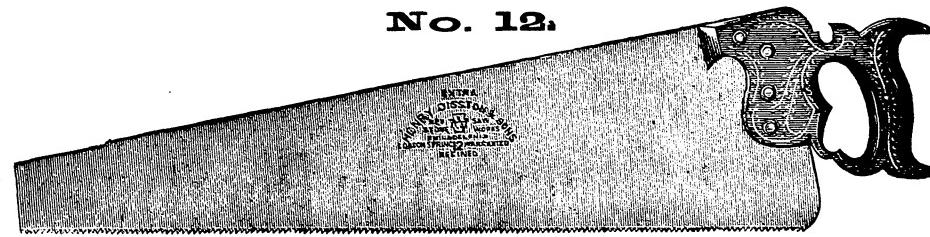
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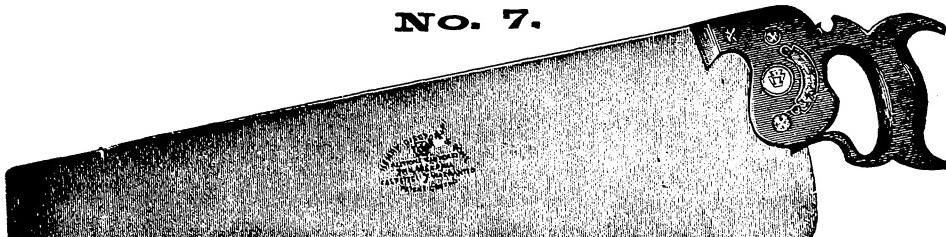
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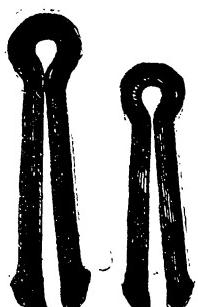
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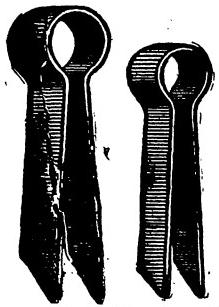
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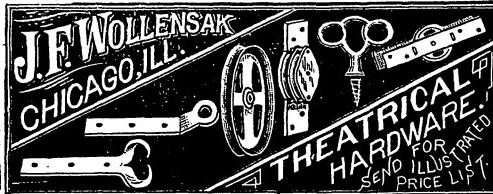
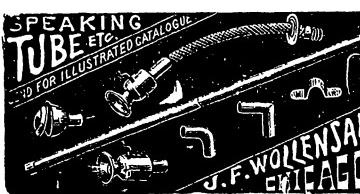
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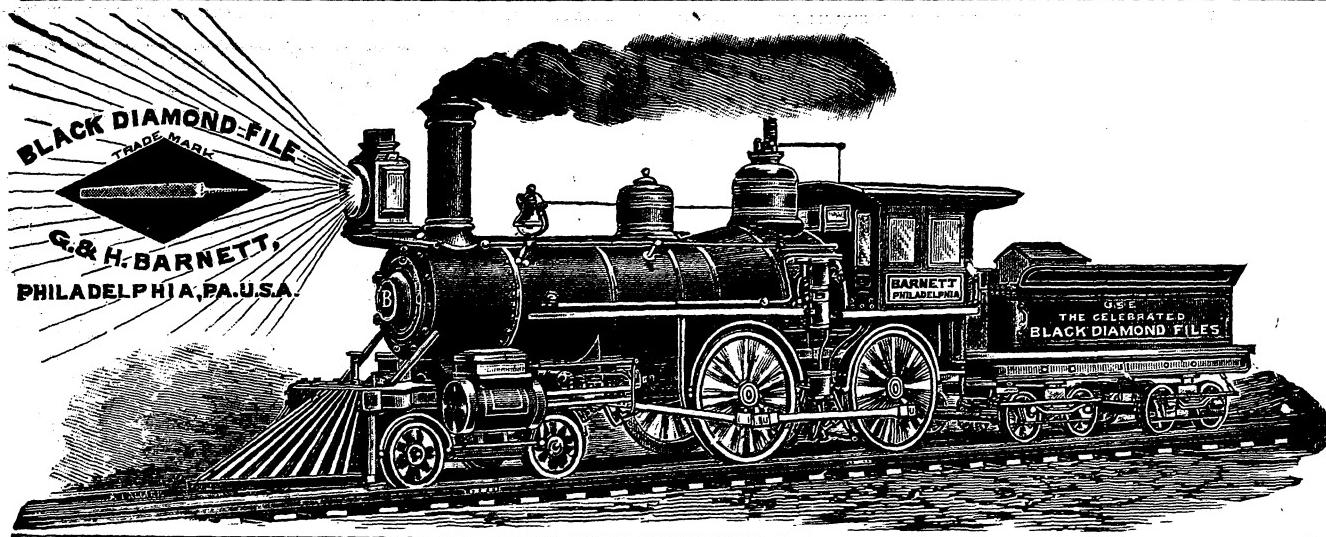
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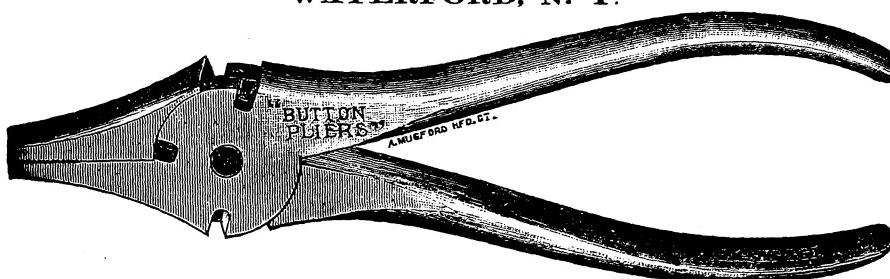
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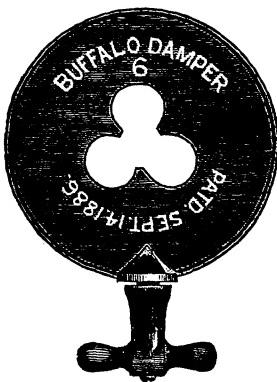
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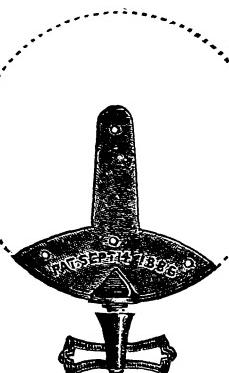
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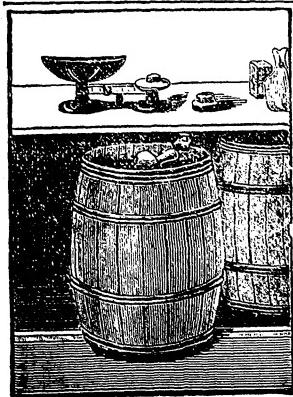
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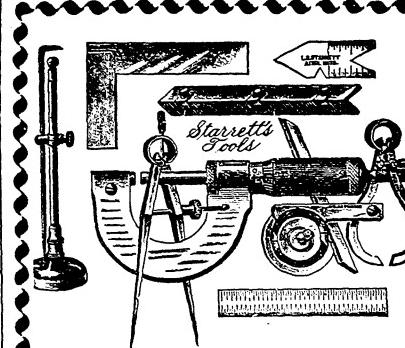
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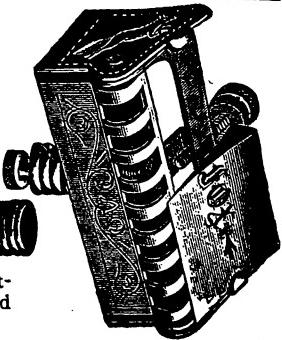
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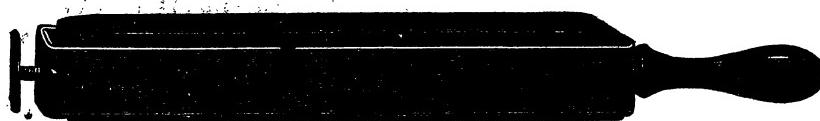
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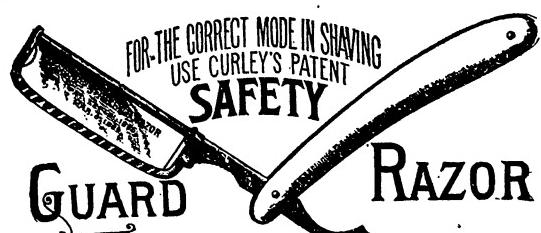
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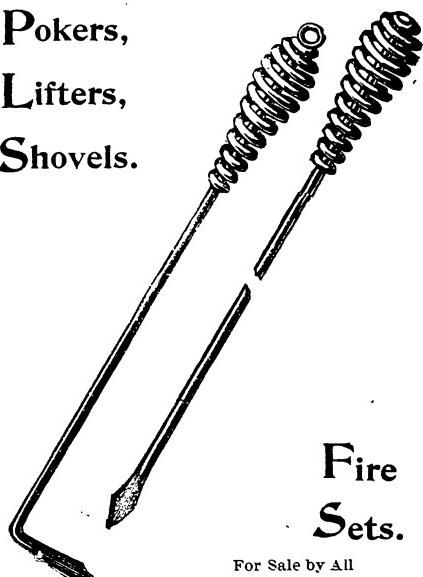
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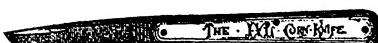


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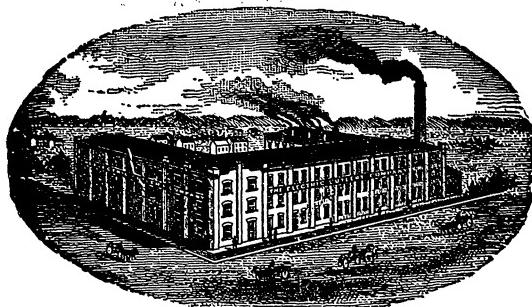
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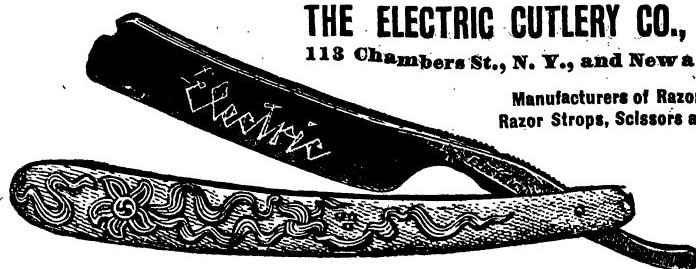


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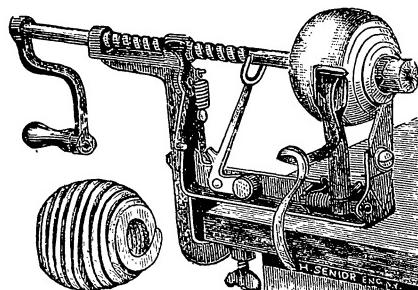
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FOR SALE BY ALL DEALERS IN HARDWARE, CUTLERY AND FANCY GOODS.



**W**E HAVE had nearly thirty years' experience in manufacturing Apple Parers.

For family use, evaporators, bakers, hotels, restaurants, etc., etc., we make Apple Parers to pare; pare and core; pare, core and slice, for hand or power use; with capacity as high as 100 bushels per day.

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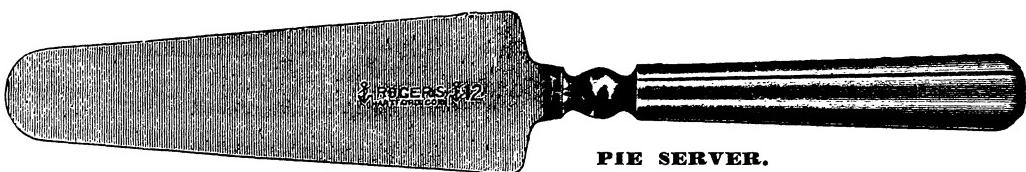
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MADE INTO SPOONS AND FORKS.

Spoons and Forks of this metal combine all the following desirable features:

LOW PRICE, DURABILITY, UNIFORMITY AND STRENGTH.



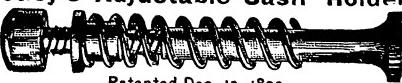
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has no plating to  
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Easily kept clean.



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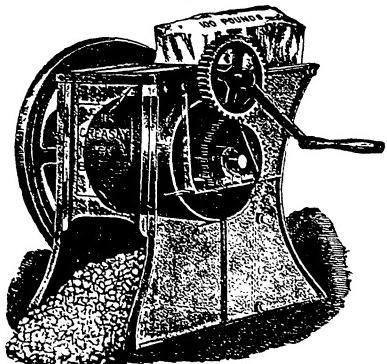
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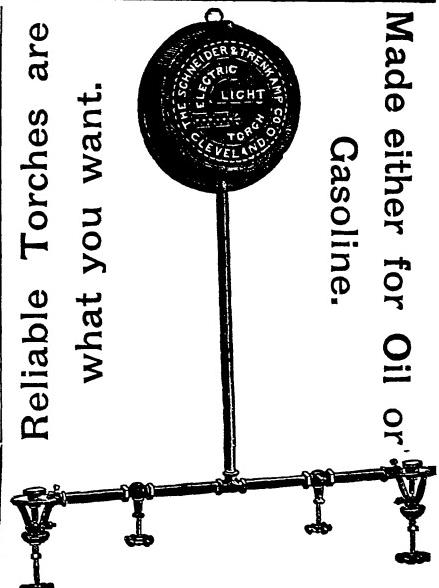
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No. 1 (Hand or Power) Machine.

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These Torches are particularly adapted for use in  
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trade. Manufactured by  
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We manufacture  
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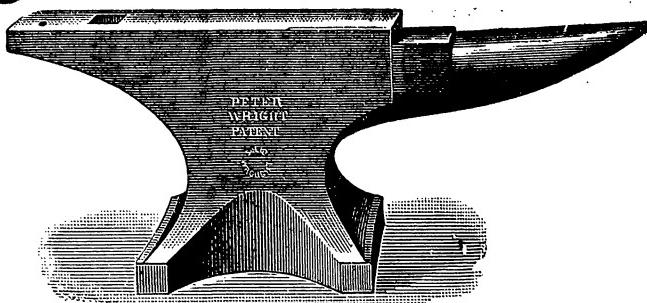
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# Peter Wright's Patent Solid Wrought Anvil

PETER  
WRIGHT  
PATENT

SOLID  
WROUGHT

*Fac-Simile of Trade-Mark.*



*Fac-Simile of Green Label.*

By Royal Letters Patent,  
V. R.  
**PETER WRIGHT'S  
SOLID WROUGHT  
ANVIL**  
Made of Best Scrap Iron!  
THE BICK FACE AND END ALL  
IN ONE SOLID PIECE!

You are cautioned in buying to see that each anvil is stamped with the full trade-mark on one side and has the green label affixed to the other.

EXHIBIT STAND No. 167,  
GROUP 71.

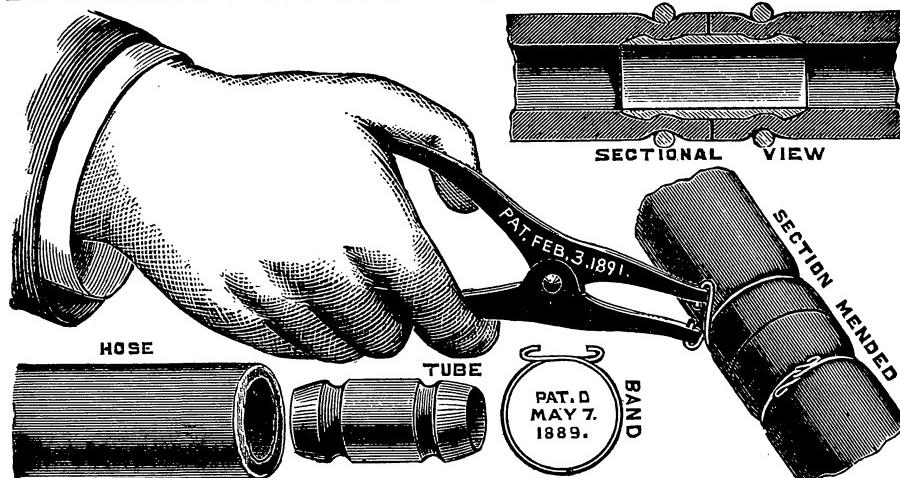
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BRITISH SECTION,  
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Put up in Boxes for Family Use.



Each Box Contains 1 Pair Pliers, 6 Tubes, 20 Bands.

Hose can be mended or Couplings fastened on.

**CHEAPER,  
QUICKER and  
MORE SECURELY**

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Screw menders tear the rubber lining from the hose. OURS will not. If you wish to handle a good thing with a good profit write for circular and prices.

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The cut represents the exact size of 6/O.

Thirteen Sizes made, 6/O being the Largest.

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Chain, made into Halters  
Traces, Cow Ties, Tie-**

**FACTORY AT  
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## Who Has Not Had Bad Hose?

Who has not lost time, patience, money, by attempting settlement for such goods?

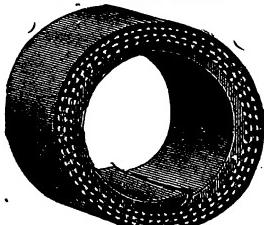
THE CAUSE in nine cases out of ten is the lapped seam.

THE REMEDY is in buying our

### PATENT SEAMLESS-TUBE HOSE,

Made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

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Over Two Million Feet

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alone during the past year,  
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the United States, and not a  
single piece complained of,  
justifies us in guaranteeing  
that it will give absolute  
satisfaction.

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Makers of Mechanical Rubber Goods, Clothing, Druggist's Sundries, Specialties, Etc.

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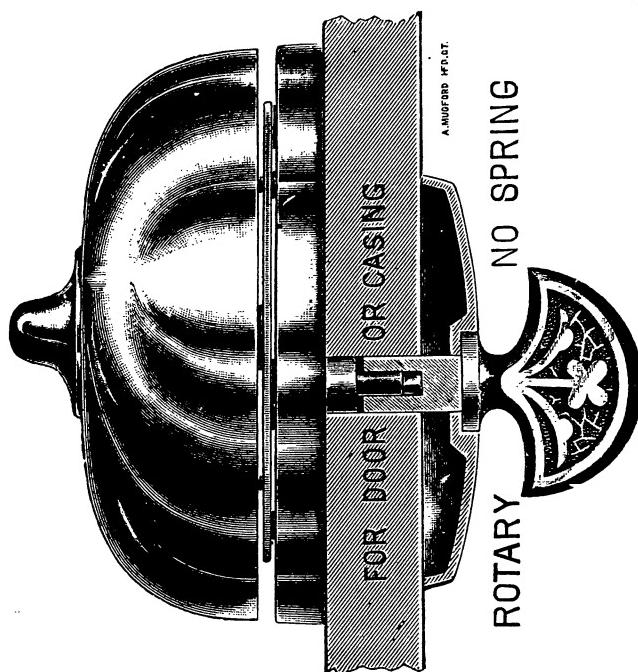
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COTTON RUBBER-LINED HOSE.**

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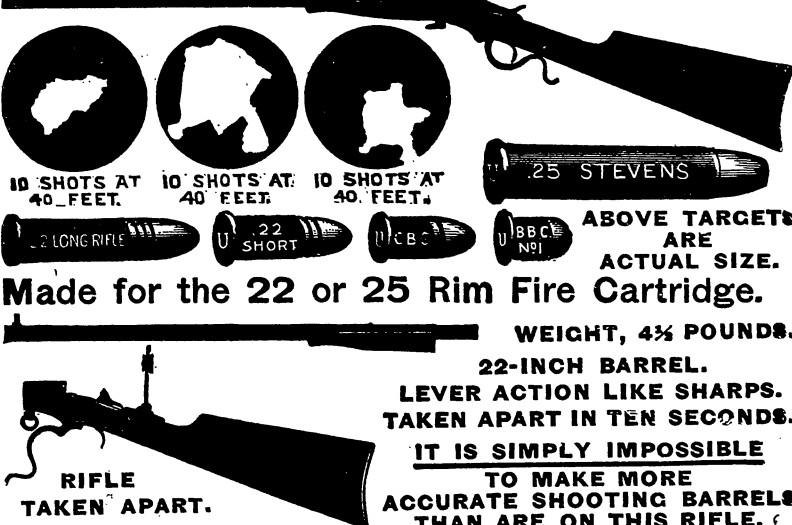
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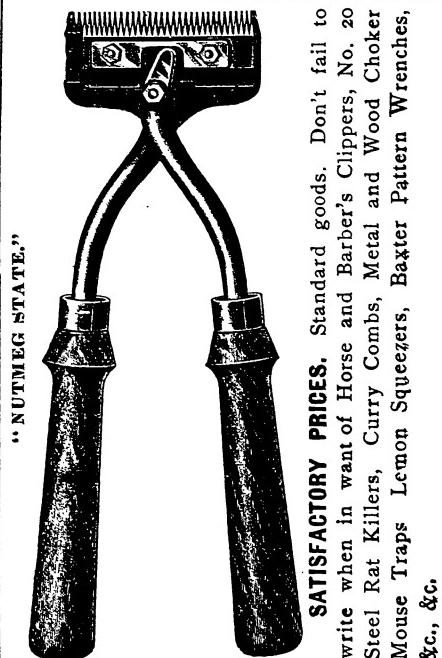
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Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.



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Have placed the Agency for the United States for the sale of their celebrated

**POCKET KNIVES, RAZORS, Etc.,**

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**The Hardware Trade**

Can buy this buggy for L. C. X X.  
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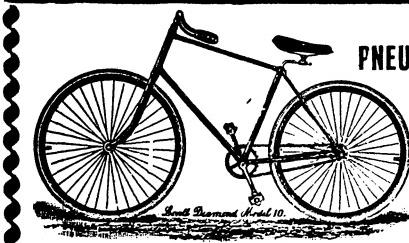
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FOR LADIES AND GENTLEMEN  
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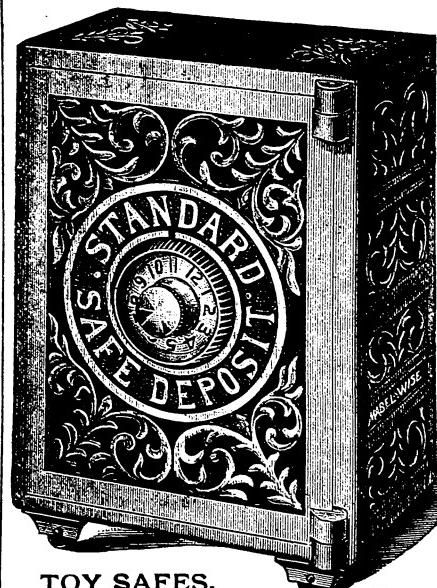
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Please mention *The Iron Age* when you write.

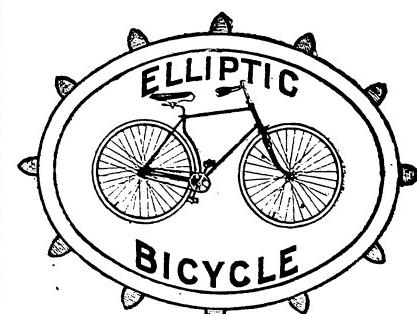
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TOY SAFES.



## WORLD'S RECORDS.

1-4 Mile, flying start,	.26 1-5	ONE
1-4 " standing start,	.30	MILE,
1-2 " flying start,	.55 1-2	
1-2 " standing start,	.58 3-5	
1 " flying start,	1:56 3-5	1:56 3-5.
1 " standing start,	2:04 3-5	

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FIG. 8. Showing Davis cork-screw and fulcrum position to pull cork.

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Manufacturers of

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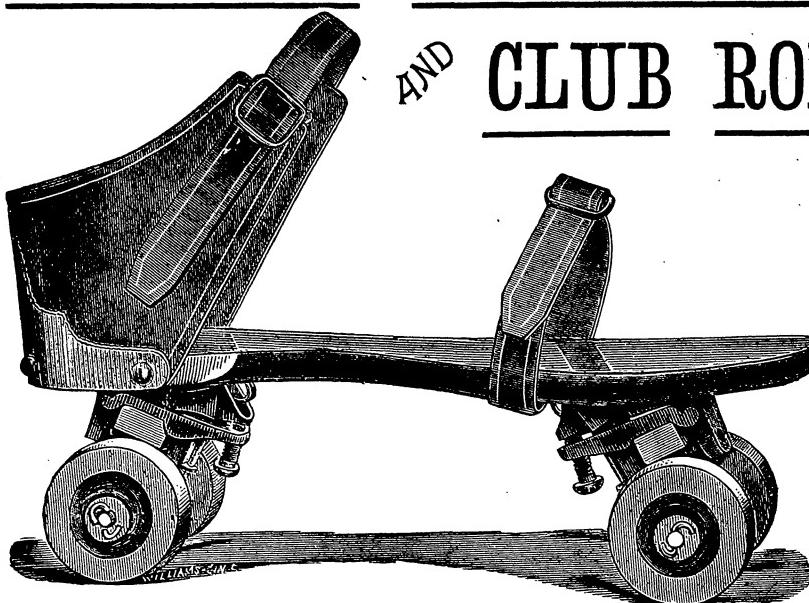
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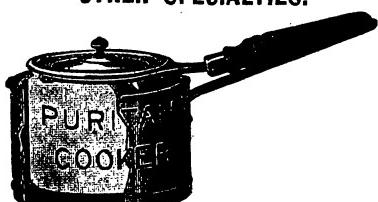
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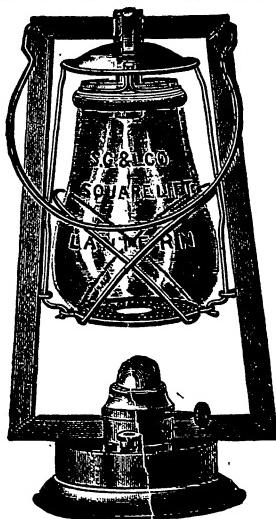
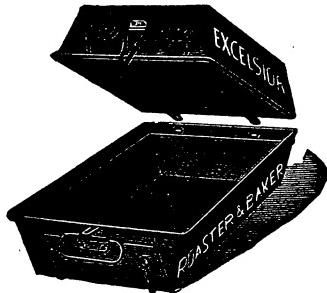


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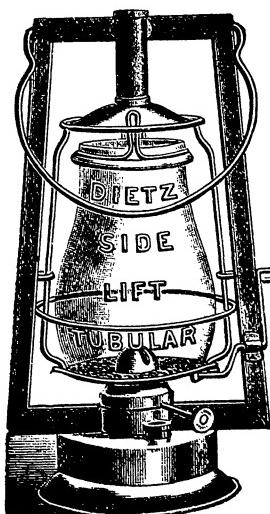
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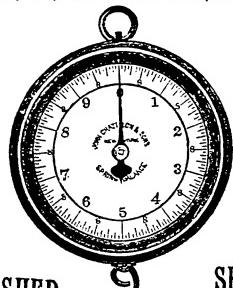
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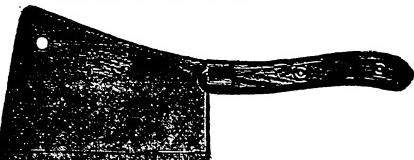


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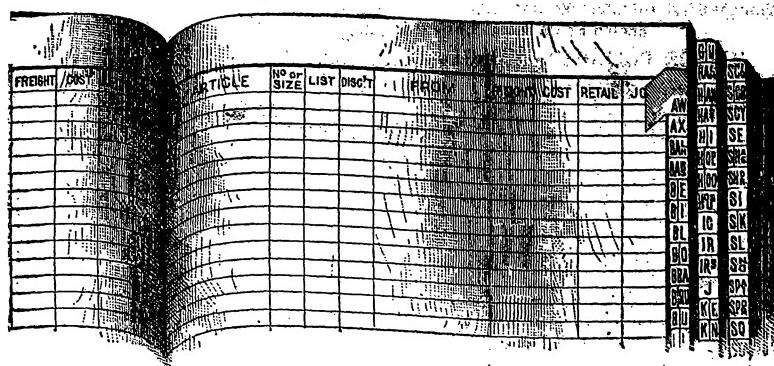
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**NEW HAVEN, CONN.**



# The Iron Age Hardware Price Book E.

SECOND EDITION, REVISED AND ENLARGED, WITH MULTIPLE INDEX (Patent Pending).



AD	GU	SC
AN	HAL	SCR
AU	HAN	SCY
AW	HAS	SE
AX	HI	SH
BAL	HOD	SHO
BAR	HOO	SI
BE	HOS	SK

Fac-Simile of Indexing.

**SIZE.**—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

**PAPER.**—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

**BINDING.**—The binding is of the very best quality—flexible seal grained leather.

**INDEX.**—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

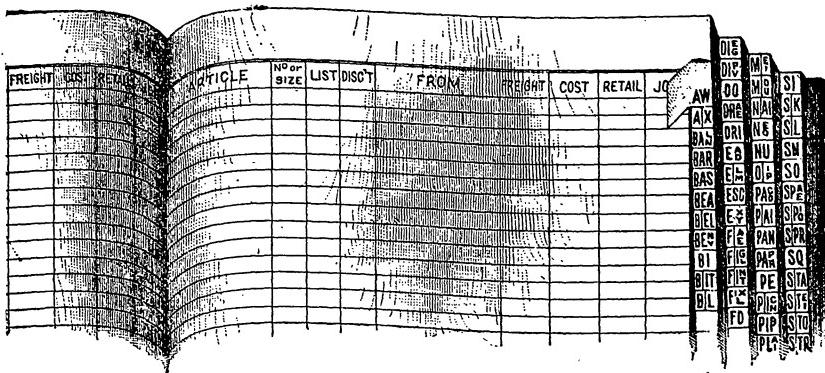
**ARRANGEMENT.**—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

**SUPPLEMENT.**—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.**

# The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD	DIE	ME	SI
AN	DIP	MO	SK
AU	DO	NAI	SL
AW	DRA	NE	SN
AX	DRI	NU	SO
BAL	E	O	SP
BAR	E	PAC	SP
BAS	ESC	PAI	SPR

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Sufficient space has been provided for large lines of goods such as Axes, Bits, Sprines, etc., by allowing four pages to such indices instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A in the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

**ARRANGEMENT.**—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

**SUPPLEMENT.**—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.**

## Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to AU	For Chisels,	turn to CH	For Iron,	turn to IRO
" Parers, Apple	" PAP	" Cutlery,	" CUT	" Irons,	" IR'S
" Saws,	" SAW	" Cartridges,	" CAR	" Shovels,	" SHO
" Pumps,	" PUM	" Rules,	" RUL	" Grindstones,	" GRI
" Bits,	" BIT	" Locks,	" LO	" Stones,	" STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

**Hardware Classification.**—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

**Standard Lists.**—In connection with these price books a set of *The Iron Age STANDARD HARDWARE LISTS* can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

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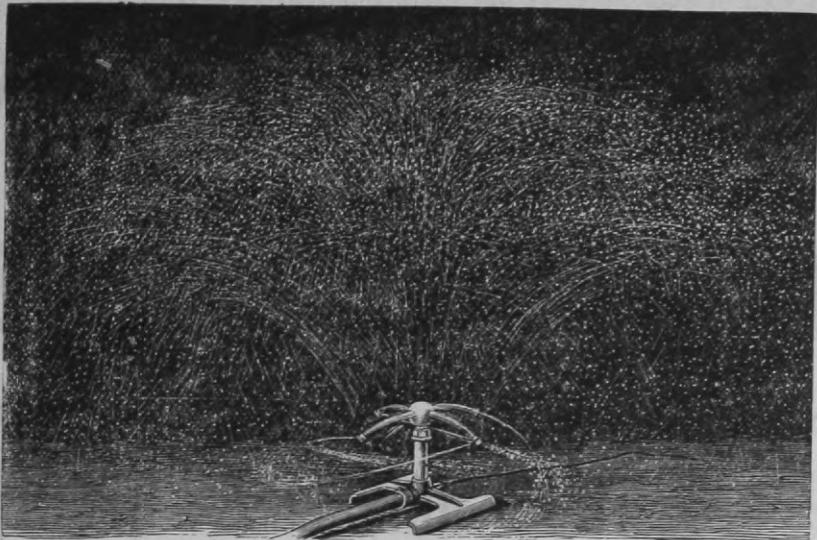
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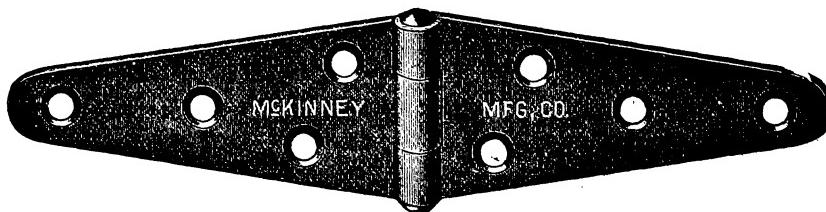
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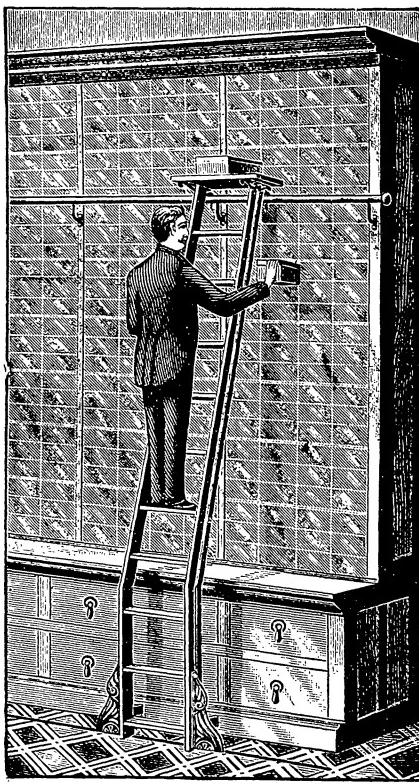
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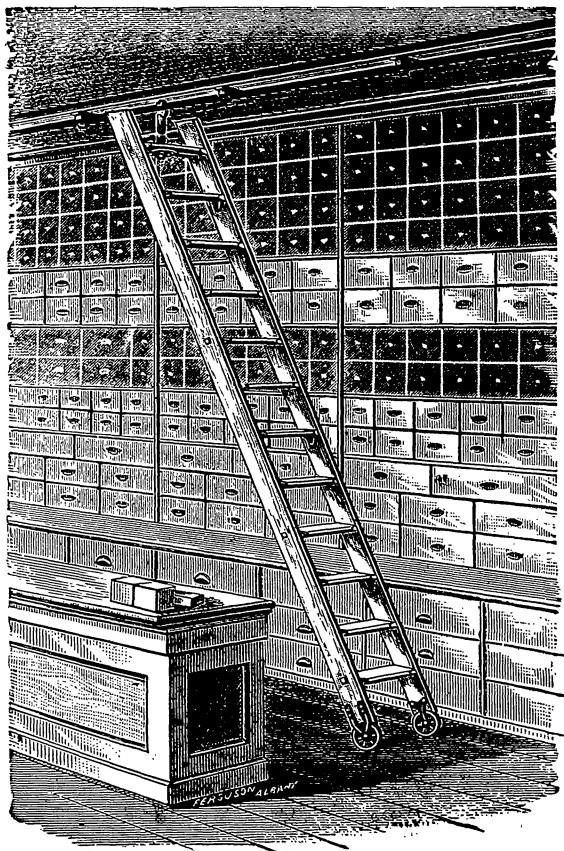
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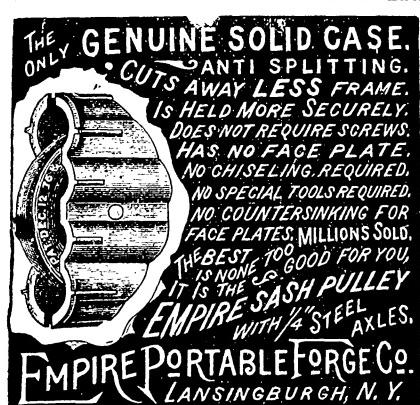


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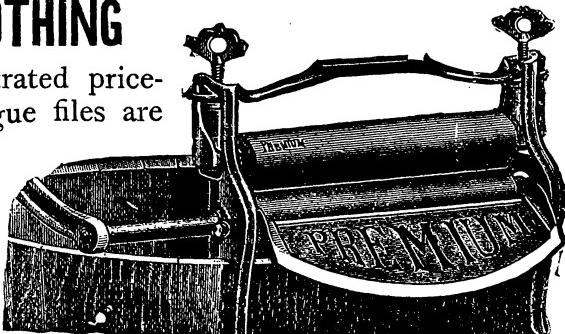
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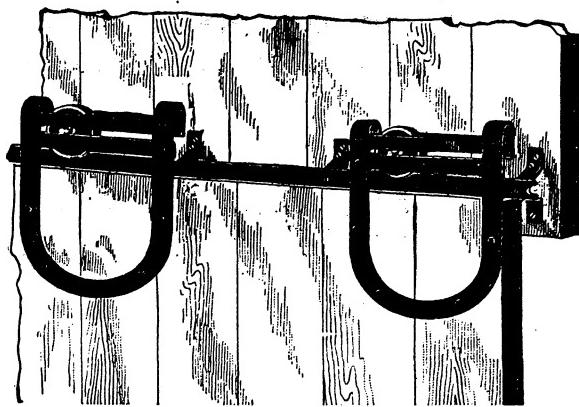


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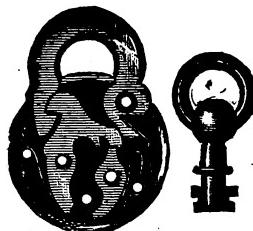
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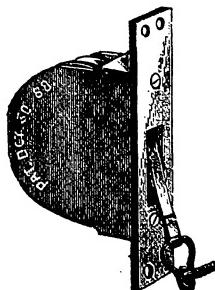


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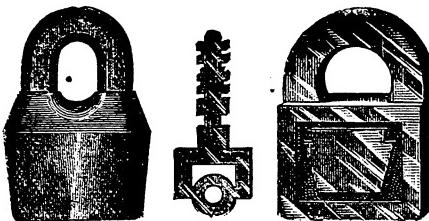
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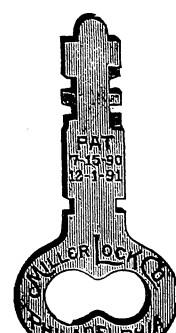
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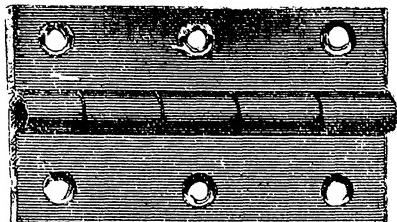
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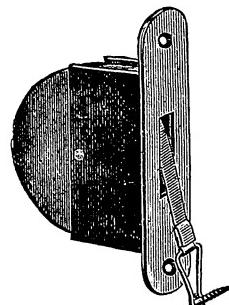
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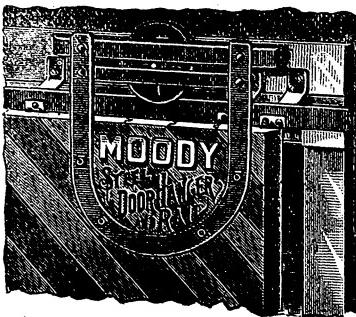
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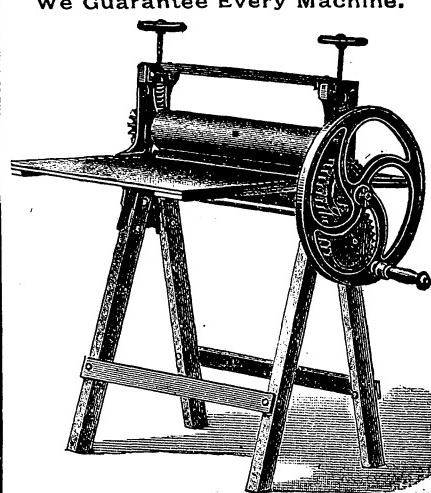
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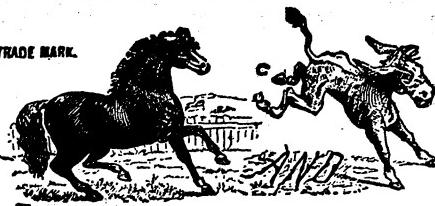
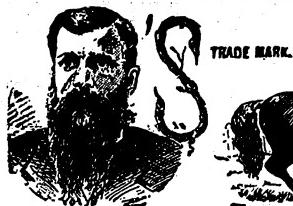
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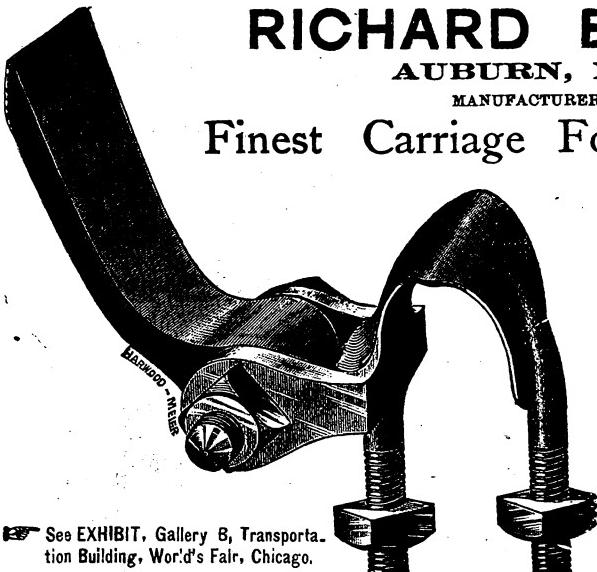
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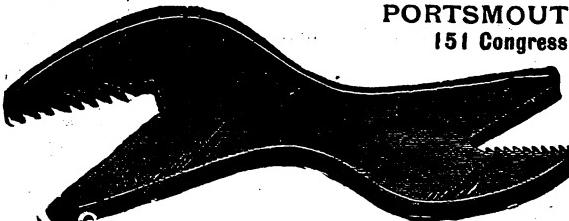
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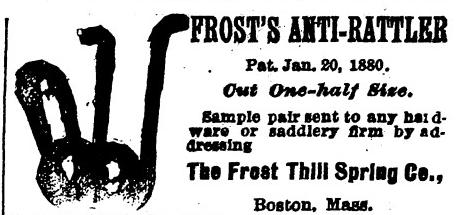
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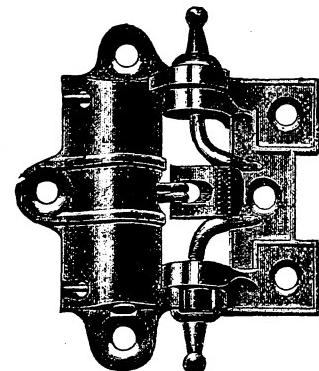
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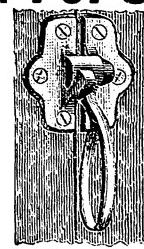
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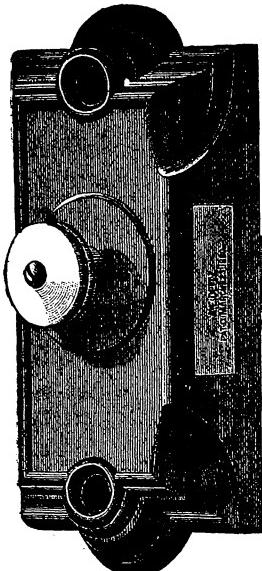
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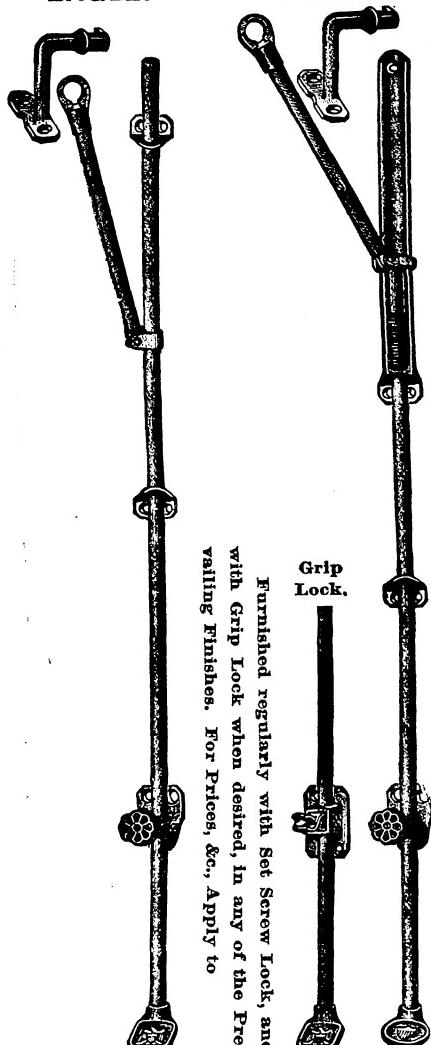
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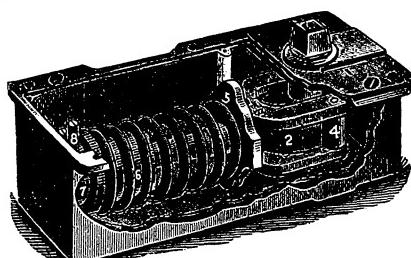
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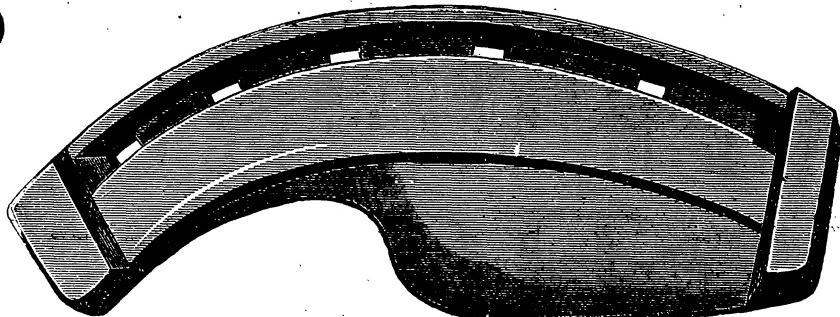
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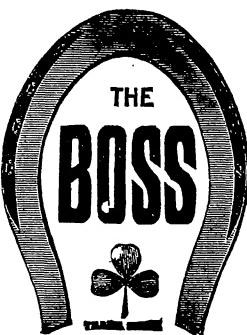
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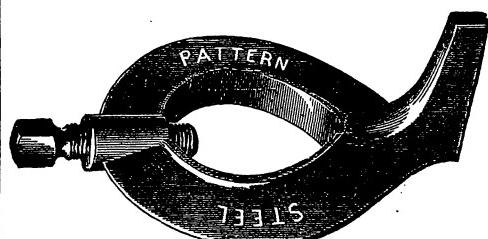
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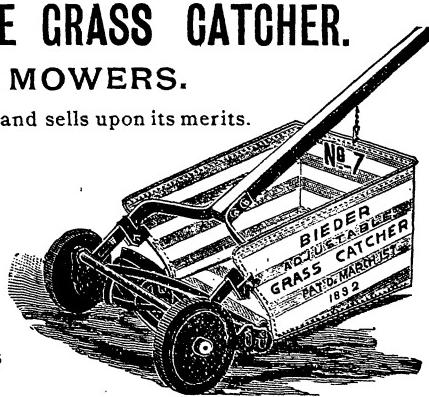
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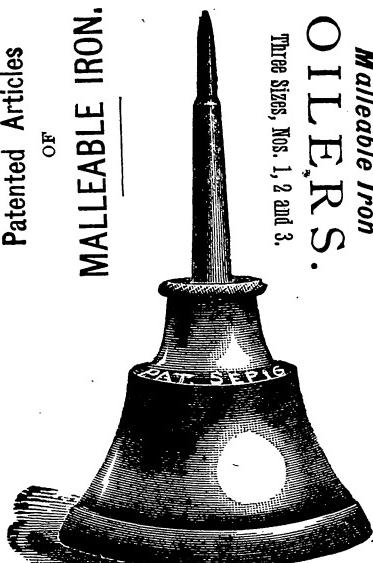
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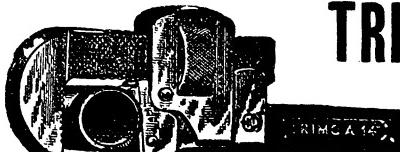
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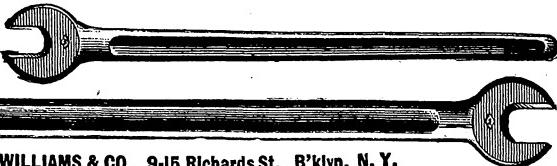


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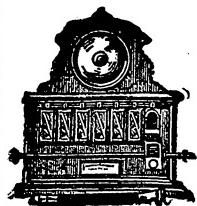
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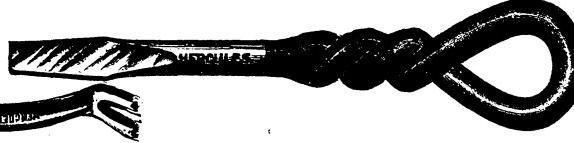
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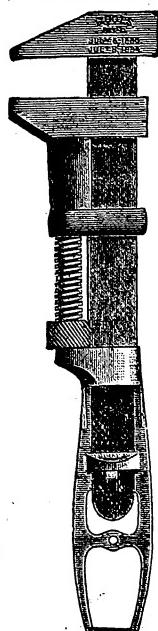
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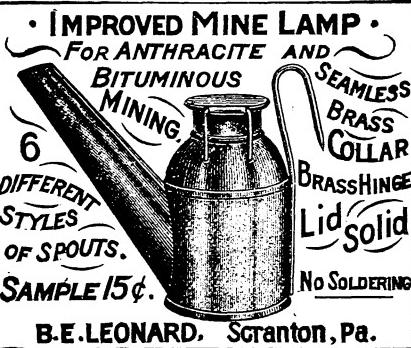
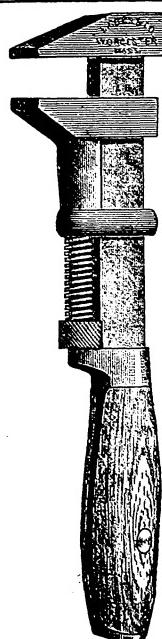
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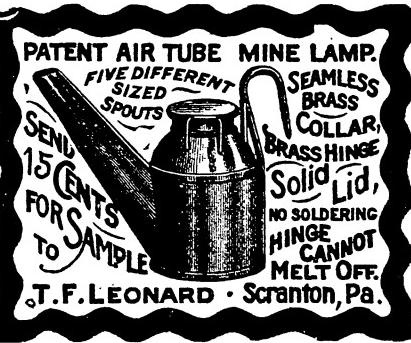
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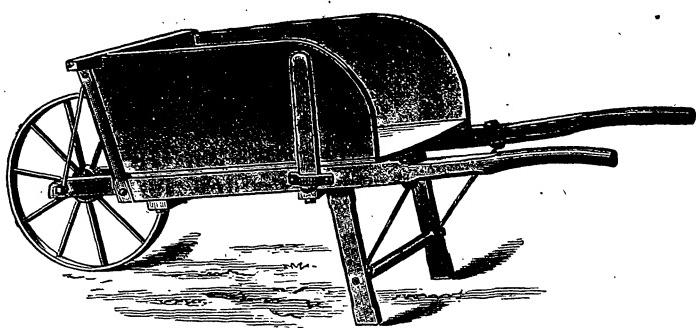
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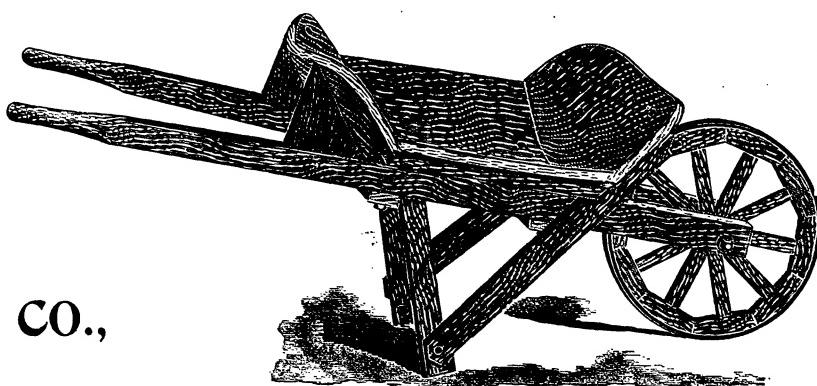
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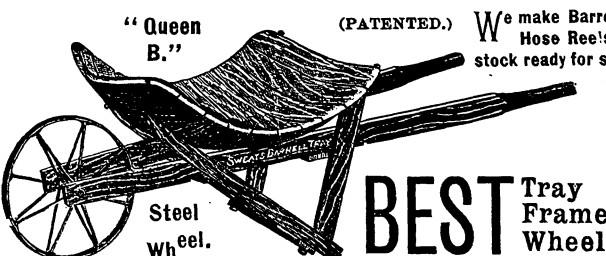
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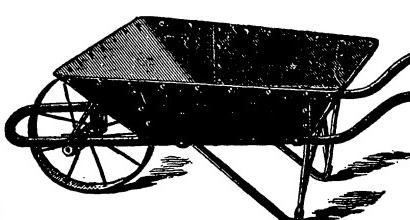
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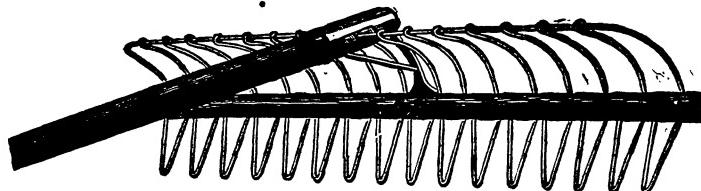
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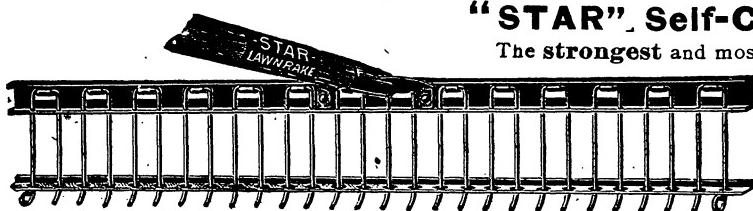
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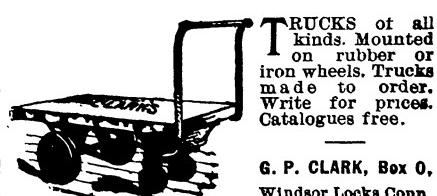
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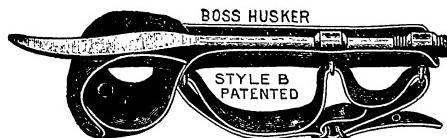
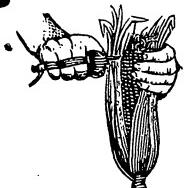
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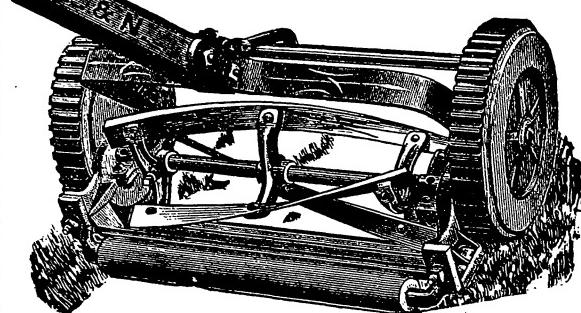
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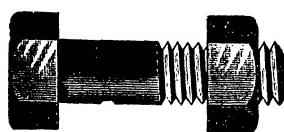
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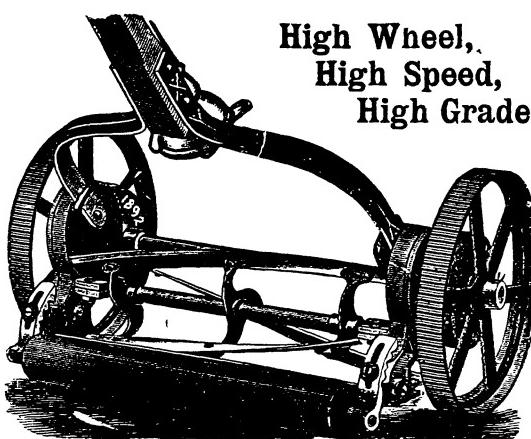
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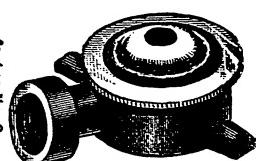
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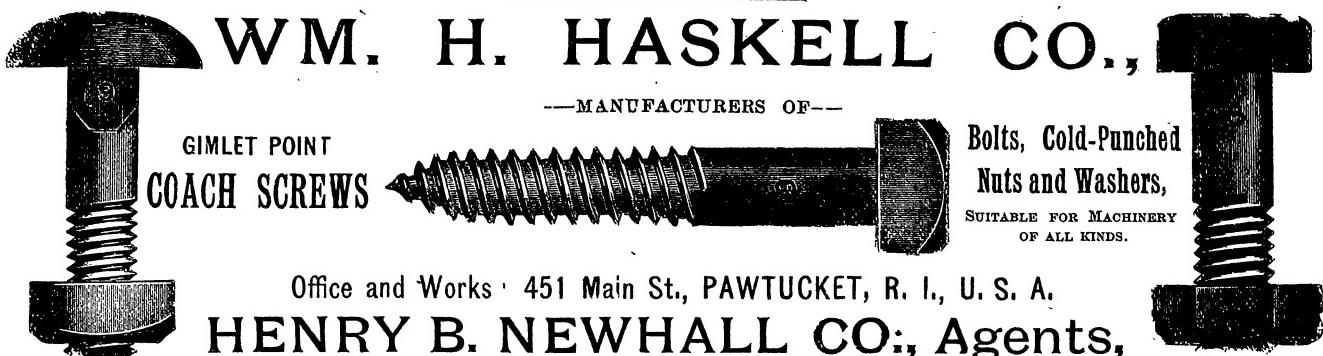
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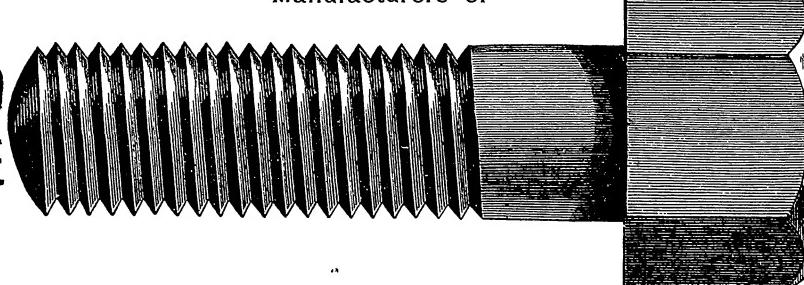
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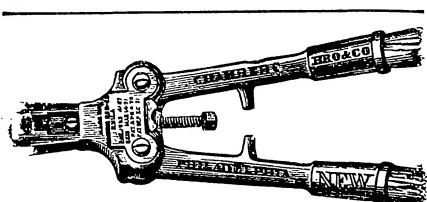
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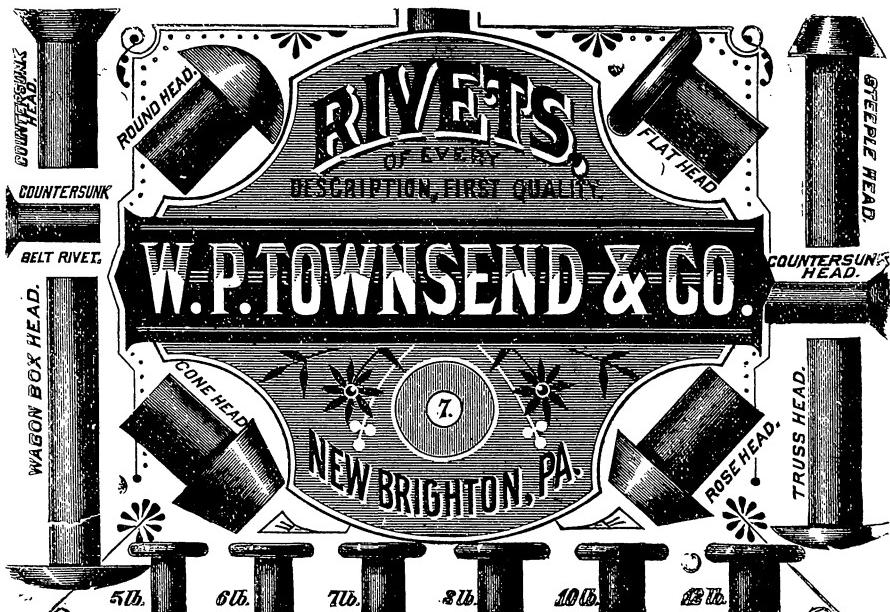
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 Coulter & McKenzie Mch. Co., Bridge  
port, Conn.  
 Crankshank, D. B., Providence, R.  
 Detrick & Harvey Mch. Co., Balti-  
more, Md.  
 Ehrhardt, Gustave & Sons, Pittsburgh,  
Pa.  
 Fitchburg Mch. Works, Fitchburg  
Mass.  
 Garvin Mch. Co., Leight & Canal St.,  
Gould & Eberhard, Newark, N. J.  
 Hamilton Mch. Tool Co., Hamilton, O.  
 Harrington, E. Son & Co., Phila, Pa.  
 Hendey Machine Co., Torrington, Ct.  
 Hill, Clarke & Co., Boston, Mass.  
 Ingersoll Milling Machine Co., Rock  
ford, Ill.  
 Johnson, Israel H., Jr., & Co., Phila.  
 Jones & Lamson Mch. Co., Springfield,  
Vt.  
 Kelly, Daniel, Phila., Pa.  
 Lodge & Davis man. Tool Co., Cincin-  
nati, O.  
 Lodge & Shipley Mch. Tool Works  
Cincinnati, O.  
 Lovegrove & Co., Philadelphia, Pa.  
 McCabe, J. J., 68 Cortlandt, N. Y.  
 Machinists Supply Co., Rochester, N. Y.  
 Manville, E. J. Mch. Co., Waterbury,  
Conn.  
 Morton Mfg. Co., Muskegon Heights,  
Mich.  
 Newark Mch. Tool Works, Newark, N. J.  
 New Haven Mfg. Co., New Haven, Conn.  
 New York Maen'y Depot, N. Y.  
 Niles Tool Wks., 188 Liberty St., N. Y.  
 Pedrick & Ayer, Philadelphia, Pa.  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.  
 Place, Geo., 120 Broadway, N. Y.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Pratt & Whitney Co., Hartford, Conn.  
 Prentiss Tool Co., N.Y.  
 Scranton Supply & Mohry, Co., Scrat-  
ton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seybert's Sons L. F., Philadelphia, Pa.  
 Stepto, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wilson, W. A., Rochester, N. Y.  
 Woodruff Mfg. Co., Hartford, Conn.

**Machinery for Hardware Man-  
ufacture.**

Adt, Jno. & Son, New Haven, Conn.

**Machine Knives.**

Loring Coes & Co., Worcester, Mass.

**Machine Tools.—See machinery.****Machinist Work.**

Papping, J., 68th St., & 11th Ave., N. Y.

City.

**Machinists' Scales.**

Conin & Leighton, Syracuse, N. Y.

Starett, L. S., Athol, Mass.

**Machinists' Tools and Supplies.**

King, J. M. & Co., Waterford, N. Y.

Sellers, Wm. & Co., Inc., Phila.

**Mallets.**

N. Y. Mallet & Handle Works, N. Y.

**Mangles.**

Johnson, S. C., Racine, Wis.

**Manufacturing Sites.**

Kokomo Enterprise Co., Kokomo, Ind.

**Measuring Tapes.**

Lufkin Rule Co., Saginaw, Mich.

**Meat Cutters.**

Enterprise Mfg. Co., Philadelphia, Pa.

**Metals.**

Fearing, Wm. S., 100 Chambers, N. Y.

Hendricks Bros., 49 Cliff, N. Y.

Naylor & Co., 45 Wall, N. Y.

**Metal Brokers.**

American Metal Co., N. Y.

**Metallurgists.**

Britton, J. Blodgett, Phila.

**Metal Saws.**

Ehrhardt, Gaetava & Sons, Pittsburg

Q & Co., Chicago, Ill.

**Milling Machines.**

Cin. Milling Mch. Co., Cincinnati,

Ohio.

Ingersoll Milling Machine Co., Rock

ford, Ill.

Pedrick & Aver, Phila, Pa.

**Mincing Knives.**

Palmer Hdwy. Mfg. Co., Troy, N. Y.

**Mine Lamps.**

Darby, Edw. & Sons Phila, Pa.

Leonard, B. E., Scranton, Pa.

Leonard, T. F., Scranton, Pa.

**Mining Screens.**

Harrington & King Perforating Co.

Chicago, Ill.

Hendrick Mfg. Co., Ltd., Carbondale,

Pa.

Howard & Morse, 45 Fulton, N. Y.

**Mirrors.**

Rice, C. F., Chicago, Ill.

**Molding Sand.**

Chicago Foundry Supply Co., Chicago,

Ill.

Obermayer, S. Co., Cincinnati, O.

Parson, J. W. & Co., Phila.

**Motors, Water and Electric.**

C. & C. Electric Motor Co., 402 and  
404 Greenwich St., N. Y.

Dallett, Thos. H. & Co., Phila., Pa.

Thomson, Houston Motor Co., Boston,

Mass.

**Nail Machinery.**

Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nails (Cut) and Spikes.**

Borden & Lovell, 70 West, N. Y.

Cumberland Nail & Iron Co., Phila.

Oxford Iron Co., 31 Washington, N.

Pottstown Iron Co., Pottstown, Pa.

Riverside Iron Wks., Wheeling, W. Va.

**Nickel Platers' Supplies.**

Zicker & Lovett Chemical Company,

10 to 14 Grand St., N. Y.

**Norway Shapes, Rollers of.**

Bowland, William & Harvey, Fram-

ford, Philadelphia

**Nut Machines.**

Dunham Nut Mch. Co., Unionville, O.

**Nuts, Bolts, &c., Makers of.**

American Bolt Co., Lowell, Mass.

American Screw Co., Providence, R. I.

Blake & Johnson, Waterbury, Conn.

Haskell, Wm. H. Co., Pawtucket, R. I.

Mt. Carmel Bolt Co., Mt. Carmel, Conn.

Port Chester Bolt and Nut Co.,

Chester, N. Y.

**Oil Stones.**

Pike Mfg. Co., Pike Station, N. H.

**Oil Stoves.**

Glazier Stove Co., Chelsea, Mich.

**Ores.**

Winter, Francis, Philadelphia, Pa.

**Ore Shees.**

Scranton Forging Co., Scranton, Pa.

**Packing.**

Billingham, Jas. H. & Co., Phila., Pa.

Morrison, Robt., St. Louis, Mo.

N. Y. Belting & Packing Co. Ltd., N. Y.

**Padlocks.**

Ames Sword Co., Chicopee, Mass.

Frame, E. T., Lancaster, Pa.

Hillebrand & Wolf, Phila., Pa.

Miller Lock Co., Philadelphia, Pa.

**Paint.**

Detroit Granite Mfg. Co., Detroit,

Mich.

Dixon, Jos. Crucible Co., Jersey City, N.J.

**Faint Burners.**

Dangler Stove & Mfg. Co., Cleveland, O.

**Patent Solicitors.**

Fitzgerald, S. C., Washington, D. C.

Hoson & Hoson, Phila. & Washington,

Jenner, H. W. T., Washington, D. C.

Stocking, E. B., Washington, D. C.

**Perforated Metal.**

Clinton Wire Cloth Co., Clinton, Mass.

Warrington & King Perforating Co.,

Chicago, Ill.

Hendrick Mfg. Co., Ltd., Carbondale,

Pa.

**Phosphor Bronze.**

Phosphor Bronze Smelting Co., Lim-  
ited, 512 Arch, Philadelphia.

**Phosphor Tin.**

Crescent Phosphorized Metal Co.,

Philadelphia, Pa.

Crosby Steam Gauge & Valve Co., Bos-  
ton, Mass.

Halk & Naumann, 516 Pearl, N. Y.

**Picks and Mattocks.**

Plumb, Fayette R., Philadelphia, Pa.

**Pig Iron.**

Houston, C. B. & Co., Philadelphia, Pa.

Mann, Edwin R., Philadelphia, Pa.

Montour Iron & Steel Co., Danville, Pa.

Naylor & Co., 45 Wall, N. Y.

Pickens, Brown & Co., Chicago, Ill.

Pilling & Crane, Philadelphia, Pa.

Samuel, Frank, Philadelphia, Pa.

**Pig Iron Storage.**

Am. Pig Iron Storage Warrant Co., 44

Wall, N. Y.

**Pile Drivers.**

Vulcan Iron Wks., Chicago, Ill.

**Pipe, Bent.**

National Pipe Bending Co., New Haven

**Pipe Cutting and Threading Ma-  
chines.**

Bignal & Keeler Mfg. Co., St. Louis, Mo.

Merrill Mfg. Co., Toledo, O.

Pancoat Henry B. & Co., Philadelphia,

Sander's Sons, D. Yonkers, N. Y.

**Pipe Grips.**

Prentiss Vise Co., 44 Barclay, N. Y.

**Pipes, Fitting, &c., Makers of.**

McNab & Hartin Mfg. Co., N. Y.

**Pipe, Water and Gas, Makers of.**

Cumberland Nail & Iron Co., Phila., Pa.

Donaldson Iron Co., Evans, Pa.

Riverside Iron Works, Wheeling, W.

Wood, R. D. & Co., Philadelphia, Pa.

**Plane Irons, Manufacturers of.**

Buck Bros., Millbury, Mass.

**Planes, Manufacturers of.**

Stanley Rule & Level Co., N. Y.

**Plate, Iron and Steel, Mfrs of.**

Eta-Standard Iron & Steel Co.,

Bridgeport, O.

Tenkens Iron & Steel Co., Coatesville, Pa.

Mahoning Valley Iron Co., Youngs-  
town, Ohio.

Moorhead-McLean Co., Pittsburgh, Pa.

Mollvain & Sons, Reading, Pa.

Pottstown Iron Co., Pottstown, Pa.

Pottsville Iron & Steel Co., Pottsville,

Pa.

**Plating, Nickel, Brass and**

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

**Piping, Nickel, Brass and**

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

**Plating, Nickel, Brass and**

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

**Plating, Nickel, Brass and**

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

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Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

**Plating, Nickel, Brass and**

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

- Allentown Rolling Mill, Allentown, Pa.  
Illinois Steel Co., Chicago, Ill.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
Passaic Rolling Mill Co., Paterson, N.J.  
Pottsville Iron & Steel Co., Pottsville, Pa.  
Roberts, A. & P. & Co., Phila., Pa.  
The Phoenix Iron Co., Phila., Pa.  
Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**  
Acome Shear Co., Bridgeport, Conn.  
Heinrichs, R. Sons Co., Newark, N.J.
- Sheet Iron and Steel, Manufacturers.**  
Alma Standard Iron and Steel Co., Bridgeport, C.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Chess Bros., Pittsburgh, Pa.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Moorehead-McCleane Co., Pittsburgh, Pierson & Co., 29 Broadway, N.Y.  
Reilly, John W., Fort Hunter P.O., Pa.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
- The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Work.**  
Clark & Cowles, Plainville, Conn.
- Sheet Zinc.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**  
Koch, A. E. & Co., Peoria, Ill.
- Shovels, Spades and Scoops.**  
Meyers, H. M. Co., Beaver Falls, Pa.
- Sinks.**  
Douglas, W. & B., Middletown Conn.
- Skates, Ice.**  
Dame, Stoddard & Kendall, Boston, Mass.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**  
Henley, M. C., Richmond, Ind.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**  
Reeves, Paul S., 760 S. Broad, Phila.
- Speaking Tubes.**  
Ostrander, W. R. & Co., 204 Fulton St., N.Y.  
Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**  
Konigslund, O., Cleveland, O.
- Speed Indicators.**  
Church & Sleight, 103 Fulton St., N.Y.
- Speleoth.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**  
Hartley & Graham, 313-315 B'way, N.Y.
- Springs.**  
American Spiral Spring Co., Pittsburgh, Pa.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N.Y.  
Morgan Spring Co., Worcester, Mass.  
Nourse, Fred. Co., 315 to 319 E. 22d St., N.Y.  
Sabin Machine Co., Montpelier, Vt.  
Tuck Mfg. Co., Brockton, Mass.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.
- Spring Hinges.**  
Bardsley, J. 149 & 151 Baxter St., N.Y.  
Fullum Sash Balance Co., Rochester, N.Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Co., 14 Warren St., N.Y.
- Spring Keys and Cotters.**  
Whitman & Barnes Mfg. Co., Syracuse, N.Y.
- Sprinklers.**  
Smith, Oliver A., Clarkston, Mich.
- Stamped Ware.**  
Am. Stamping Co., 104 & 106 John St., New York.
- Stamping Works.**  
Averi Stamping Co., Cleveland, O.  
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**  
Cobb & Drew, Plymouth, Mass.  
Titchener E. H. & Co., Binghamton, N.Y.
- Steam Gauges.**  
Ashcroft Mfg. Co., 111 Liberty St., N.Y.  
Bristol's Mfg. Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**  
Deneit & Eisenhardt, Philadelphia.  
Dudgeon, Richard, 24 Columbia Street, N.Y.  
Trethewey Mfg. Co., Pittsburgh, Pa.
- Steam Heating.**  
Webster Warren & Co., Phila., Pa.
- Steam Separators.**  
Goubert Mfg. Co., 32 Cortland St N.Y.
- Steel Balls.**  
Grant Anti-Friction Ball Co., Fitchburg, Mass.
- Steel, Cold Rolled Strip.**  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabets.**  
Krogerud, W., 61 Fulton, N.Y.
- Steel Importers.**  
Abbott, Jere & Co., N.Y. and Boston.  
Hobson, Francis, Seaman & Co., N.Y.  
John St., N.Y.  
Jessop, Wm. & Sons, Sheffield, Eng.  
Land, or 91 John, N.Y.  
Milne, A. & Co., 1 Broadway, N.Y.  
Newton & Shipman, 83 John, N.Y.  
Wetherell Bros., 93 Liberty St., N.Y.  
Whitney, A. B. & Co., B'dway, N.Y.  
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N.Y.
- Steel Manufacturers.**  
Alma Standard Iron & Steel Co., Bridgeport, C.  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Boher, Herman & Co., 103 Duane St.  
Coborn Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chromite Steel Works, Brooklyn, N.Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Eiken & Co., Hagen, Germany.  
Frankford Steel Co., Philadelphia.  
Gruetzel Steel Department or Cambris Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., N.Y.  
John St., N.Y.  
Illinois Steel Co., Chicago, Ill.  
Jessop, Wm. & Sons, Sheffield, Eng.  
Land, or 91 John, N.Y.  
Kaiser, Ellison & Co., Sheffield, Eng.  
La Belle Steel Co., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Moorthill-McCleane Co., Pittsburgh, Pa.  
Moss, F. W., 83 John, N.Y.  
Naylor & Co., 40 Wall, N.Y.  
Pottsville Iron and Steel Co., Pottsville, Pa.  
Riley, J. W., Fort Hunter P.O., Pa.  
Rowland, Wm. & Harvey, Frankford Philadelphia.  
Singer, Nimick & Co., Pittsburgh.  
Stanley Works, New Britain, Conn.  
Steel & Iron Improvement Co., Pittsburgh, Pa.  
Taylor Iron & Steel Co., High Bridge, N.J.  
Wordell Bros., S. & C., Sheffield, Eng.  
Wetherell Bros., 93 Liberty, N.Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**  
Barnes, C. K. & Co., Philadelphia, Pa.  
Corning, Edw. & Co., 29 B'way, N.Y.  
Lindson, Jas. G. & Co., Phila., Pa.  
Pierson & Co., 29 Broadway, N.Y.
- Steel Rails, Manufacturers of.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Illinois Steel Co., Chicago, Ill.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.
- Steel Spiral Springs, Manufacturers.**  
Chatillon, John & Sons, N.Y.  
Roland, Wm. & Harvey, Frankford.  
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N.Y.
- Steel Tools.**  
Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, Eng.  
Land, or 91 John, N.Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders.**  
Bicycle Step Ladder Co., Chicago, Ill.  
Croissant, M., Albany, N.Y.
- Stocks and Dies.**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Sather's Sons, D., Yonkers, N.Y.  
Wells Bros. & Co., Greenfield, Mass.  
Willey & Russell Mfg. Co., Greenfield, Mass.
- Storage.**  
Security Warehouse, E. St. Louis, Ill.
- Stove Linings.**  
Ostrander Fire Brick Co., Troy, N.Y.
- Stove Pipe Thimbles.**  
Cheney, S. & Son, Manlius, N.Y.
- Stove Trimmings.**  
Troy Nickel Works, Troy, N.Y.
- Street Lamps.**  
Dietz, R. E., Co., 60 Laight St., N.Y.  
Steam Gauge & Lantern Co., Syracuse, N.Y.
- Straps.**  
Electric Cutlery Co., 113 Chambers, N.Y.  
J. R. Torrey & Co., Worcester, Mass.
- Stropping Machines.**  
Schmitz, E. Lothar, 92 Reade St., N.Y.
- Structural Iron Work.**  
Berlin Iron Bridge Co., East Berlin, Conn.  
Boston Bridge Wks., Boston, Mass.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Wrought Iron Bridge Co., Canton, O.
- Sulphuric Acid.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**  
Atlas Tack Corporation, Boston, Mass.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Nat. Screw & Tack Co., Cleveland, O.  
Phillips, E. & Sons, South Hanover.  
Plymouth Mills, Plymouth, Mass.  
Trafant, W. E., Whitman, Mass.
- Taps and Dies.**  
Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R.I.  
Manning, Maxwell & Moore, 111 Liberty, St., N.Y.  
Wells Bros. & Co., Greenfield, Mass.  
Willey & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**  
Riehle Bros. Testing Mch. Co., Philadelphia.
- Testing Machines.**  
Riehle Bros. Testing Mch. Co., Phila.
- Theatrical Hardware.**  
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**  
Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.
- Time Record.**  
Scattergood, H. W., Phila., Pa.
- Tinners' Hardware.**  
Berger Bros., Philadelphia, Pa.
- Tinning Precors.**  
Sands, Thomas, Nashua, N.H.
- Tin Plate Machinery.**  
Lloyd Booth Co., Youngstown, Ohio.
- Tinware.**  
Am. Stamping Co., 104 & 106 John St., Mattathai, Ingram & Co., Baltimore, Md.
- Tire Upsetters.**  
Butts & Ordway, Boston, Mass.  
Illinoian Iron & Bolt Co., Carpenterville, Ill.
- Tee Calks, Steel.**  
Burke, P. F., Boston, Mass.
- Tool Chests.**  
Am. Tool Co., 200 W. Houston St., N.Y.
- Tools.**  
Brown, R. H. & Co., New Haven, Conn.  
Channell Tool Co., Reading, Pa.  
Frassie Co., 19 Warren St., New York.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Miller & Sons, N.Y.  
Millers Falls Co., 98 Reade, N.Y.  
Richardson, C. F. & Son, Athol, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, Starrett, L. S., Athol, Mass.
- Toots, Blacksmith and Wheelwrights.**  
Buffalo Forge Co., Buffalo, N.Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Illinoian Iron & Bolt Co., Carpenterville, Ill.  
Plumb, Fayette R., Philadelphia, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**  
Saunders' Sons, D., Yonkers, N.Y.
- Torches, Oil and Gasoline.**  
Dangler Stove & Mfg. Co., Cleveland, O.  
Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**  
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**  
Berger Bros., Philadelphia, Pa.  
Boston & Lockport Block Co., Boston, Mass., and Lockport, N.Y.  
Clark, G. P., Windsor Locks, Conn.  
Lansing Wheelbarrow Co., Lansing, Mich.
- Tubing, Seamless Drawn Copper.**  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N.Y.  
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**  
Leng, John S., Son & Co., 4 Fletcher St., N.Y.
- Tumbling Barrels.**  
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E.D.
- Twist Drills, Makers of.**  
Cleveland Twist Drill Co., Cleveland.  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**  
Best, Fox & Co., Pittsburgh, Pa.  
Chapman Valve Mfg. Co., Boston.  
Jenkins Bros., 71 John, N.Y.  
McNab & Harlin Mfg. Co., 56 John N.Y.  
Mason Regulator Co., Boston, Mass.
- Ventilator Appliances.**  
Howard & Morse, 45 Fulton, N.Y.
- Vise Jaws.**  
Newark Mch. Tool Co., Newark, N.J.
- Vises.**  
Hollands Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N.Y.  
Millers Falls Co., 93 Read St., N.Y.  
Prentiss Vise Co., 44 Barclay N.Y.  
Van Wagoner & Williams Co., 14 Warren St., N.Y.
- Wagon Jacks.**  
Boston & Lockport Block Co., Boston, Mass., and Lockport, N.Y.  
Covert Mfg. Co., West Troy, N.Y.  
Covert's Saddlery Works, Farmer, N.Y.
- Washers.**  
Haskell, Wm. H. Co., Pawtucket, R.I.  
Milton Mfg. Co., Milton, Pa.  
Sternbergh, J. H. & Son, Reading, Pa.
- Water Meters.**  
Worthington, H. Henry R., 86 & 88 Liberty St., N.Y.
- Water Wheels.**  
Poole, Robt. & Son Co., Baltimore, Md.
- Well Machinery.**  
Amer. Well Works, Aurora, Ill.
- Wheelbarrows.**  
Akron Tool Co., Akron, O.  
Amer. Steel Scraper Co., Sidney, Ohio.  
Cockburn Barrow & Mch. Co., Jersey City, N.J.  
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
- Whips.**  
American Whip Co., Westfield, Mass.
- Window Cord, Makers of.**  
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**  
Amer. Spiral Spring Co., Pittsburgh, Pa.  
Consolidated Steel & Wire Co., St. Louis, Mo.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N.Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Prentiss, Geo. W. & Co., Holyoke, Mass.  
Salem Wire Nail Co., Salem, O.  
Trenton Iron Co., Trenton, N.J.  
Washburn & Moen Mfg. Co., Worcester.  
Wetherell Bros., 93 Liberty St., N.Y.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N.Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Estey, W. S., 65 Fulton, N.Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Morse, 45 Fulton, N.Y.  
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Scheeler & Sons, Buffalo, N.Y.  
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Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Clevedon.
- Wire Cutters.**  
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McFarland, Wm., Trenton, N.J.  
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- Wire Door Mats.**  
Hartman Mfg. Co., Beaver Falls, Pa.  
The Wire Goods Co., Worcester, Mass.
- Wire Fences.—See Sourcing, Iron and Wire.**
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Darby, Edward & Sons, Philadelphia.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N.Y.  
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Ossawam Mills Co., Norwich, Conn.  
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- Wire Machinery.**  
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- Wire Straightening and Cutting Machinery.**  
Adt, John & Son, New Haven, Conn.
- Wire Nails.**  
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Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N.Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Phillips, E. & Sons, South Hanover Mass.  
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- Wire Screens.**  
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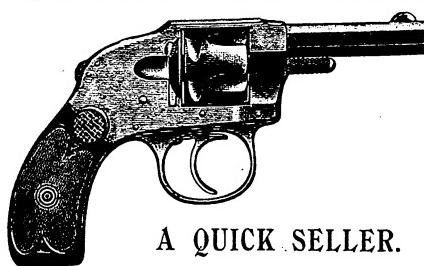
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Morgan Spring Co.	4	Pottsville Iron & Steel Co.	17	Standard Tool Co.	50	Wilkie, Bothwell & Co.	30
Morrison, Robert.	32	Powell Planer Co.	43	Standard Tool Co.	67	Williams, J. H. & Co.	94
Morse Twist Drill & Machine Co.	50	Pratt & Whitney Co.	49	Stanley Rule & Level Co.	107	Williamson, C. T. Wire Nov. Co.	107
Morse, Williams & Co.	53	Prentiss, Geo. W. & Co.	9	Stanley Works.	65	Williamsport Wire Rope Co.	6
Morton Mfg. Co.	41	Prentiss Tool & Supply Co.	57	Stark Mch. & Tool Co.	43	Wilmot & Hobbs Mfg. Co.	1&3
Morton, Thos.	87	Prentiss Vise Co.	67	Starrett, L. S.	73	Wilson, E. H. & Co.	18
Moseley Iron Bridge & Roof Co.	13	Pullman, J. Wesley.	23	Steam Gauge & Lantern Co.	83	Wilson, J.	74
Motley, Peter.	77	Pullman Sash Balance Co.	88	Stearns, E. C. & Co.	64	Wilson, J. Fred.	100
Mount Carmel Bolt Co.	107	Q & C Co.	13	Steel & Iron Improvement Co.	64	Wilson, W. A.	43
Myers, F. E. & Bro.	68	Queen Anne Screen Co.	70	Stepto, J. & Co.	59	Winklev, Sm'l, Skate Mfg. Co.	80
Myers, H. M. Co.	68	Quint, A. D.	45	Sterling Emery Wheel Co.	54	Wire Goods Co.	6
National Horse Nail Co.	93	Rainey, W. J.	1	Sternbergh, J. H. & Son.	100	Wister, Francis.	27
National Pipe Bending Co.	33	Rand Drill Co.	36	Stover Novelty Works.	46	Wister, L. & R. & Co.	22
National Saw Co.	70	Randolph & Clowes.	1	Stover Mfg. Co.	89	Witherell, Jas. P. Co.	31
National Screw & Tack Co.	12	Read, Wm. & Sons.	107	Stow Flexible Shaft Co.	50	Wolcott & West.	60
Naylor & Co.	22	Reading Hardware Co.	83	Stow Mfg. Co.	50	Wolff, R. H. & Co. Ltd.	5
Newark Machine Tool Works.	64	Reeves, Paul S.	108	Stocking, E. B.	6	Wollensak, J. F.	72&90
New Britain Hdw. Mfg. Co.	77	Reilly, J. W.	18	Storm Mfg. Co.	70	Wood Alan & Co.	18
New Castle Wire Nail Co.	13	Reliance Wire Wks Co.	8	Stover Novelty Works.	46	Wood, R. D. & Co.	27
New Doty Mfg. Co.	53	Reynolds & Co.	13	Supplee Hardware Co.	98	Wood, W. Dewees Co.	28
New Haven Copper Co.	2	R.I. Perkins Horse Shoe Co.	92	Sweatt Mfg. Co.	96	Woodruff Mfg. Co.	51
New Haven Mfg. Co.	45	Rice, C. F.	60	Sweetser, W. A.	36	Worcester Mch. Screw Co.	100
New Haven Wire Mfg. Co.	6	Richards, D. W. & Co.	59	Swindell, W. & Bros.	31	Worthington, Henry R.	37
N. J. Wire Cloth Co.	8	Richardson, C. F. & Son.	69	Syracuse Specialty Mfg. Co.	97	Wright & Colton Wire Cloth Co.	8
New Process Twist Drill Co.	50	Ridgway, Craig & Son.	51	Taintor Mfg. Co.	72	Wright, Peter & Son.	78
New Process Raw Hide Co.	45	Riehl Bros. Testing Machine Co.	41	Tablet & Ticket Co.	63	Wrought Iron Bridge Co.	15
Newton & Shipman.	19	Ripley Mfg. Co.	70	Talcott, W. O.	39	Wurster, F. W. & Co.	108
N. Y. Belting & Packing Co.	39	Riverside Iron Works.	24	Robinson-Rea Mfg. Co.	26	Wyman & Gordon.	27
N. Y. Machinery Depot.	57	Roberts, A. & P. & Co.	20	Taylor Iron & Steel Co.	24	Yale & Towne Mfg. Co.	52&67
N. Y. Maillet & Handle Works.	69	Roberts, Frank C. & Co.	30	Zucker & Levett Chem. Co.	32	Zucker & Levett Chem. Co.	32
N. Y. Powder Co.	25	Roberts Mfg. Co.	38				
Niagara Stamping & Tool Co.	52	Robinson-Rea Mfg. Co.	26				

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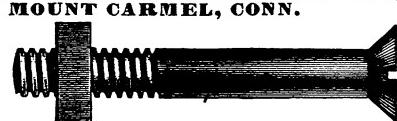
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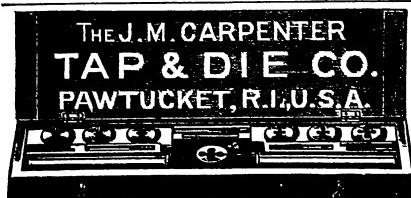
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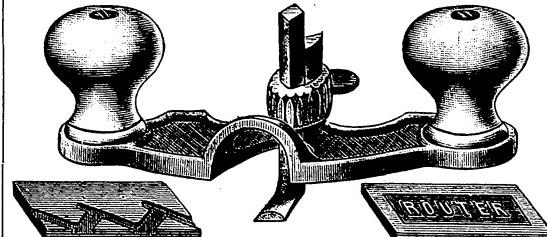
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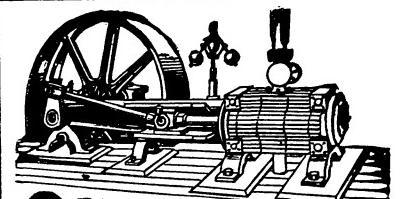
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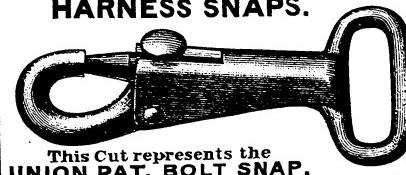
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# THE IRON AGE

THURSDAY, JULY 27, 1893.

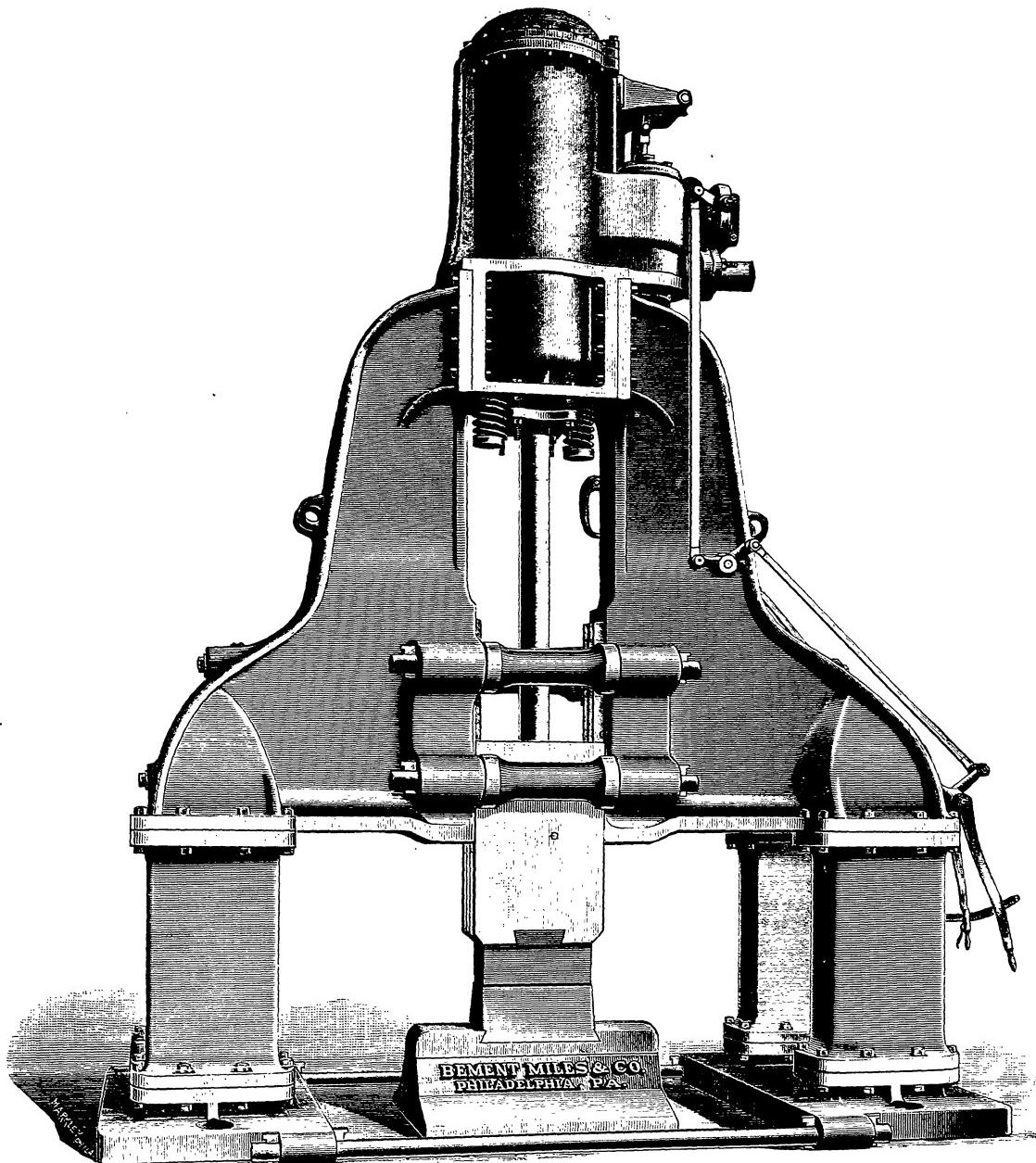
## Steam Hammer with Double Standards.

Bement, Miles & Co. of Philadelphia make hammers with or without guides, as may be desired, in sizes ranging from 500 to 30,000 pounds, that shown in the illustration being 15,000 pounds. Any of these sizes can be specially ar-

between them. The two main parts of the frame are tied together by four large bolts, two of which are plainly shown near the center of the cut. The V-shaped guides are adjustable and back of them are placed spiral springs, held in position by side bolts, which serve as buffers to take up any side jar. Provision is made for preventing the hammer ascending too far

## Shipping Armor Plate.

On the 18th and 19th inst. more than 600,000 pounds of armor plates and ordnance left the works of the Bethlehem Iron Company, consigned to the builders of the new army and navy of the United States. One of the secondary barbettes of the battle ship "Indi-



THE BEMENT, MILES STEAM HAMMER WITH DOUBLE STANDARDS.

ranged for steel or iron work. Each has a balanced valve and is double acting, valve gear being simple and substantial, taking up its own lost motion as it wears and producing every desired variety of blow. The two levers shown at the right in the engraving are extended down to the ground in order that the operator can keep the work in sight. One lever controls the throttle and the other the operating valve. Between the legs the frame is curved upward to permit of the operator standing

by means of spring buffers and steam cushioning. As the cylinder is sunk between the frame the stiffness of the entire structure is insured. The tool throughout is built unusually strong and is designed for work of the severest character.

The Newport News Shipbuilding & Dry Dock Company will construct two 10,000-ton steamers for the Southern Pacific Railroad Company, to run between New Orleans and Liverpool.

ana" was sent to Cramps' ship yard. It consists of three nickel steel plates, two 8-inch and one 6-inch.

The plates were accepted after the "Texas" redoubt test at Redington several months ago. The plates have a radius of 9 feet 5 inches, and are 5 feet 1 inch high. The diameter of the barbette will be 18 feet 10 inches. The weight of the barbette is 40 tons. In the turret surmounting it there will be two 8-inch breech-loading rifles. This is the second small "Indiana" barbette

sent out from the Bethlehem Iron Works.

A train of six cars was consigned to the Norfolk Navy Yard. It contained six 12-inch nickel-steel "Texas" turret plates. Set up, they will have a radius of 13 feet 3 inches or a diameter of 26 feet 6 inches. The plates are 6 feet 1 inch high. There is one port plate in each, each having one port hole and two sight holes. The "Texas" turrets will contain 12 inch guns. The weight of the shipment is 104 tons.

Another shipment for the "Texas" is the redoubt shutter plate. The redoubt consists of 16 12-inch plates, weighing a little more than 400 tons. Fifteen have already been sent and placed on the deck of the battle ship. One was kept at the works by order of the department to be so machined as to perfectly fit the gap after the others had been placed. It is 8 feet 3½ inches high and weighs 56,000 pounds.

Capt. Ira McNutt, army inspector at the Bethlehem Ordnance Works, sent six carloads of gun forgings to the Watervliet Arsenal. The shipment included three 12-inch tubes, one 10-inch and two 12-inch jackets and 12 10-inch and four 12-inch hoops. At Watervliet the forgings will be assembled into finished guns for the army. The weight of this consignment of 250,000 pounds,

#### To Build New Works.

According to the Pittsburgh *Dispatch* the Westinghouse Electric & Mfg. Company are completing the plans for new works to be located there. The plant will consist of three main brick buildings and several smaller ones. The machine shop will be 750 feet in length by 312 wide, and will have three floors. The foundry and casting shop will be 725 x 300 feet, with two stories. The third building will be of the same dimensions as the foundry, and will be used as a storage and warehouse, with rooms for packing, finishing, &c. Ground will be broken and the work of construction commenced by September 1. The foundry is to be ready for business early next spring, and by July 1, 1894, the whole plant is to be going.

In building this works the Westinghouse Company intend to concentrate their electrical manufacturing in one big plant. The works on Lacock street, Allegheny, those on Garrison alley, Pittsburgh, and the big plant at Newark, N. J., will be abandoned.

The test of the biggest guns of the navy, which will be used on the battle ships now under construction, will soon take place at the naval ordnance proving ground on the Potomac. There are two of these guns completed and practically ready for testing, the interest, of course, centering on the trial of the first gun. The delay in testing is caused by the want of a mount for this immense gun. The ordnance officers will not wait for the regular service carriage, which will be some time in completion. In the test of all 13-inch guns a cast-iron carriage will be used. The gun is 40 feet long and weighs nearly 400,000 pounds. The projectile travels 374 inches in the gun before it is released on its errand of destruction. It will take 550 pounds of powder to throw the shell with the required force. The shell weighs 1100 pounds, and, with the powder charge indicated, would leave the mouth of the gun with a velocity of 2100 foot-seconds.

## The Production of Pig Iron.

The American Iron and Steel Association has published its usual semi-annual statistics of the production of pig iron. The total production of pig iron in the United States in the first half of 1893 was 4,562,918 gross tons, against 4,387,317 tons in the second half of 1892, an increase of 175,601 tons. The production in the first half of 1892 was, however, 4,769,683 tons. Compared with the first half of 1892 the production of the first half of 1893 shows a decrease of 206,765 tons. The production of the second half of the present year will undoubtedly be less than that of the second half of last year, so that the total production of 1893 will be much less than the total production of 1892.

The details concerning the output, grouped by States, according to fuel used, are as follows :

#### Production of Anthracite and Mixed Anthracite and Coke Pig Iron.

States.	First half of 1892.	Second half of 1892.	First half of 1893.
New York.....	121,009	107,198	95,884
New Jersey.....	44,282	43,693	39,598
Pennsylvania....	766,409	714,523	719,752
Total.....	931,699	865,414	855,234

#### Production of Bituminous Coal and Coke Pig Iron.

States.	First half of 1892.	Second half of 1892.	First half of 1893.
New York.....	33,637	32,214	41,542
Pennsylvania....	1,447,181	1,253,938	1,504,362
Maryland.....	45,210	44,161	87,329
Virginia.....	163,582	177,556	151,647
North Carolina...	1,543	1,055	2,445
Georgia.....	.....	.....	10,863
Alabama.....	433,358	402,482	403,447
West Virginia...	80,288	74,555	66,398
Kentucky.....	29,450	23,899	37,201
Tennessee....	132,651	117,241	96,664
Ohio.....	643,815	559,111	589,606
Indiana.....	5,431	2,269	5,313
Illinois.....	477,961	471,489	335,771
Wisconsin....	23,453	69,382	75,189
Minnesota....	13,218	953	10,373
Missouri.....	16,964	12,004	15,225
Colorado.....	10,448	21,993	37,119
Total.....	3,558,069	3,264,197	3,470,444

What increase in the production over the second half of 1892 there has been, has taken place in coke iron, Pennsylvania being conspicuous in this respect while Illinois shows a heavy falling off.

#### Production of Charcoal Pig Iron.

States.	First half of 1892.	Second half of 1892.	First half of 1893.
Massachusetts....	4,178	3,768	4,119
Connecticut....	9,856	7,251	7,335
New York.....	9,193	7,145	3,350
Pennsylvania....	3,293	8,517	1,848
Maryland.....	4,771	4,989	2,400
Virginia.....	524	1,205	508
North Carolina...	310	.....	.....
Georgia.....	3,830	6,620	5,546
Alabama.....	45,773	33,683	44,501
Texas.....	6,403	2,210	5,888
Kentucky.....	3,199	.....	80
Tennessee....	24,563	25,626	31,875
Ohio.....	7,520	11,467	5,037
Michigan.....	91,190	93,231	81,907
Wisconsin....	48,703	53,423	32,816
Missouri.....	13,670	14,382	7,104
Oregon.....	3,439	4,180	2,076
Total.....	270,915	257,706	237,240

The quantity of spiegeleisen and ferromanganese made in the first half of 1892 was 87,374 gross tons; in the second half, 91,757 tons; total, 179,131 tons. In the first half of 1893 the quantity of spiegeleisen and ferromanganese produced amounted to 47,976 tons.

The production of some of the leading districts in Pennsylvania and Ohio is given in the following table :

#### Production in Pennsylvania and Ohio Districts.

	First half of 1892.	Second half of 1892.	First half of 1893.
Pennsylvania:			
Lehigh Valley.....	286,632	271,480	243,305
Schuylkill Valley ..	238,139	210,062	227,209
U. Sus. Valley.....	80,120	60,917	74,579
L. Sus. Valley.....	227,108	213,846	242,411
Juniata Valley.....	68,920	59,611	64,348
Shenango Valley...	254,998	151,236	276,674
Allegheny Co. ....	907,474	887,733	955,718
Mis. bituminous....	150,148	133,431	139,870
Charcoal....	3,293	8,517	1,848
Ohio:			
H. R. bituminous..	50,763	49,543	46,631
Mahoning Valley...	244,779	232,422	247,340
Hocking Valley....	30,442	19,415	31,478
Mis. bituminous....	317,831	257,731	274,157
H. R. charcoal....	7,520	11,467	6,087

Pittsburgh has made an exceptional record, its output being 27.5 per cent. of the total make of coke iron, or 22.1 per cent. of the production of anthracite and coke iron combined.

#### Bessemer Pig Iron.

It is a very interesting fact that the production of Bessemer pig iron in the first half of 1893 was the largest half-yearly production in our history, amounting to 2,374,890 gross tons, against 2,189,696 tons in the second half of 1892, and 2,254,845 tons in the first half. The details for the different States are as follows:

#### Production of Bessemer Pig Iron.

States.	First half of 1892.	Second half of 1892.	First half of 1893.
New York.....	72,436	61,287	63,295
New Jersey....	3,997	13,228	1,822
Pennsylvania....	1,251,025	1,238,705	1,489,154
Maryland.....	44,248	49,376	87,329
North Carolina...	1,353	1,055	2,445
West Virginia...	80,238	74,555	66,398
Kentucky.....	16,815	7,542	15,646
Ohio.....	342,490	296,403	282,106
Illinois.....	389,588	411,073	295,383
Missouri.....	24,989	19,961	22,329
Wisconsin....	2,800	.....	2,258
Minnesota....	13,218	853	10,373
Colorado.....	10,448	20,908	36,352
Total.....	2,254,345	2,189,696	2,374,890

For the different leading districts the figures are as follows:

#### Production of Bessemer Pig Iron in Pennsylvania and Ohio Districts.

	First half of 1892.	Second half of 1892.	First half of 1893.
Pennsylvania:			
Lehigh Valley.....	98,365	103,214	94,785
Schuylkill Valley ..	57,951	32,309	53,507
Upper Susquehanna	57,266	47,870	64,033
Lower Susquehanna	176,713	196,996	215,699
Shenango Valley...	105,950	70,255	146,475
Allegheny County..	644,932	679,189	792,201
Miscel. bituminous.	109,868	108,862	122,454
Ohio:			
Mahoning Valley...	95,077	88,603	80,576
H. R. Rock bit...	20,357	14,829	13,803
Hocking Valley....	227,256	193,001	187,727

While there has been a marked increase in the production of Bessemer pig, it is a fact that the large steel works, who do not report their stocks, have very considerably increased the

amount of iron which they are carrying. We know of two concerns who went into July with 35,000 and 50,000 tons stock, respectively. So far as present indications go, the steel rail works have the better part of the year behind them. They either have already reduced, or are about to reduce, their output of Bessemer pig very materially, so that the heaviest shrinkage will be in this department.

#### Stocks.

Mr. Swank makes his usual statement of stocks, which do not include pig iron sold and not removed from the furnace bank, nor pig iron manufactured by rolling-mill proprietors for their own use, nor the small quantities of foreign pig iron in bond at ports of entry. They do, however, include stocks in the hands of receivers or creditors.

Interesting as the figures are, they do not fully cover the case, particularly now, when the quantity of iron carried by rolling mills and steel works, of their own make and for their own use, is known to be exceptionally heavy. We fail to find any figures in the group of Illinois, Wisconsin and Minnesota representing the large stock of foundry iron made by one large concern. In mill iron and Bessemer pig the over stock carried by steel works and rolling mills is very important, because it tells very much upon the operations of the independent, outside furnaces, whose customers or whose competitors these works may be, according to the circumstances. The American Iron and Steel Association should present both groups of figures.

Relative to unsold stocks, the report says: "The stocks of pig iron which were unsold in the hands of the makers or their agents on June 30, 1893, and which were not intended to be used by the manufacturers, amounted to 549,141 gross tons, in which figures are included a part of the stocks held in the yards of the American Pig Iron Storage Warrant Company, and which was under the control of the makers, the part in these yards not under their control amounting to 29,690 gross tons, which, added to the 549,141 tons above mentioned, makes a total of 578,831 gross tons which were on the market at that date.

"The stocks of pig iron which were unsold in the hands of manufacturers or their agents, or were under their control in warrant yards, on December 31, 1892, and which were not intended for their own consumption, aggregated 506,116 gross tons. On the same date there were in storage warrant yards and not under the control of the makers 29,500 tons of pig iron, making a total of 535,616 tons which were on the market at that date, against 578,831 tons similarly held on June 30, 1893.

"There was, therefore, a total increase in stocks of pig iron on the market at the close of June last as compared with the end of December, 1892, of 43,215 tons. The accumulation of stocks was chiefly in coke and bituminous pig iron."

On the face of it, a stock of 578,831 tons on a monthly average production of 760,000 tons does not look very formidable, and it is a favorite argument to point out that it represents really only twenty odd days' make. But the true aspect of the case, which it is the best interest of all concerned to face squarely, is a little different.

The charcoal furnaces, who work for the open market without almost an exception, made in the first six months 337,340 tons, and carried at the end of

that period 184,536 tons of stock, or more than 4½ months' product.

In anthracite pig iron the stock is 120,481 tons, as compared with a production in six months of 855,234 tons. But if we deduct the make of Burden, Troy, Brooke, Pioneer, Anvil, Allentown, Bethlehem, Lackawanna, Montana and Pennsylvania, we have left, in round figures, 510,000 tons product, so that the stock represents six weeks' make instead of less than four weeks.

In coke iron more striking changes appear. A stock of 244,144 tons on a production in six months of 3,470,444 tons seems trifling. But when the furnaces who are working for the open market are considered the figures are different. Take, for instance, the Southern group, practically all of whom make their iron to sell. The production of coke iron in six months of Virginia, Georgia, Tennessee and Alabama footed up to 772,721 tons. The stock, counting in about 25,000 warrants out of makers' hands, was 132,000 tons, or one month's make.

In Pennsylvania, 55,387 tons stock on a production in six months of 1,504,362 tons looks ridiculously small. But take out Pittsburgh, with 955,718 tons and its stock of 9,600, and only large works in Western Pennsylvania besides, and the stock of 45,787 tons refers to 416,940 tons of product.

For the group of Missouri, Illinois, Wisconsin, Minnesota and Missouri plants a total product of 441,721 tons is reported with a stock of 15,400 tons, which, we presume, includes two idle plants carrying nearly 3,000 tons. But if works using their own iron are deducted we get down to 175,375 tons product.

Of the product of Ohio, about 275,000 tons sought the open market during the first six months, the stock being 56,671 tons.

Thus we find that out of the whole stock of, say, 280,000 tons of coke iron 250,000 tons is referable to a product of 1,600,000 tons of coke iron, or represents one month's make.

**Improvements in Gear Wheels.**—About 1860, in Manchester, England, a new theory was put into practice—that of casting gear wheels from machine-made molds—with the intention to do away entirely with the old method of using stock patterns that invariably had become warped or shrunken. While the average manufacturer allows the matter of gear wheels to engross but little of his attention, deeming it to be of little consequence, it is really a subject of great importance. The Union Foundry & Machine Company, Pittsburgh, Pa., have improved upon the machine mold so that accuracy and fit, the desirable requisites of good gearing, are assured. Under their system immunity is secured from uncertain pitch with the resultant train of evils, large or small, yet too well known to the average manufacturer to need mentioning.

Although accurate pitch is demanded at all times, another important quality is needed to make a perfect gear wheel—that is, a uniform standard of high tensile strength. After years of investigation and study upon the subject, the firm above mentioned claim to have attained the desired end in their special process charcoal iron. The minimum of tensile strength gained is 25 per cent. above the maximum average resisting power of metal generally used in the manufacture. Each "run" of metal is tested in their chemical and

physical laboratory and must conform to their standard average, thus giving the operator a surety upon which to rely.

#### Submarine Boats for the Navy.

A few weeks ago the Navy Department opened proposals for constructing a submarine boat and the answers received were submitted to a board of naval experts. The board has made a report in which they say that of all the plans submitted but two appear to be promising of practical results.

The two boats selected for examination have some points of resemblance in general aspect. They are of the same size, measuring nearly 150 tons when submerged. Each uses steam as the propelling power when on the surface and electricity supplied by a storage battery charged by the main engines when submerged. When they dive under the water both boats house their smoke-stacks and seal all openings with iron plates.

The essential feature of the one known as the Baker boat is the propelling apparatus, which also serves to submerge her. This consists of two screw propellers, one on either side, so arranged on a transverse shaft passing through the middle of the boat at the center of gravity that they can be turned at different angles. When the boat is to be submerged these propellers are turned upward and drive the hull under water, and when the desired depth has been reached the angle is adjusted so as to drive the boat along in a horizontal line. By revolving them slowly the boat can be maintained at any place.

The Holland boat depends for her submersion on what are known as fin rudders. They are arranged in a horizontal plane and when the propeller at the stern drives the boat ahead a slight inclination of the rudders will cause her to dive beneath the surface. This boat has another rudder arranged so as to cause her automatically to steer a straight course when under water. She also has a regulator for her fin rudders made on the plan of a Whitehead torpedo which will keep the boat at any desired depth while she runs along under the water. Each of the boats is fitted with tanks filled with compressed air, which will insure a quick return to the surface in case of any derangement of the propelling apparatus. The Baker boat is designed to make a speed of twelve knots above and ten knots under water, and the Holland boat to make fifteen knots on the surface and eight knots beneath.

Paper has been applied to many purposes of construction, one of the most remarkable being lately announced in *Le Génie Civil* of Paris. It is a factory chimney 48 feet high, composed of this material, which has just been put up at Breslau, and said to be absolutely fire-proof. The cupola of the new government observatory, at Greenwich, England, is to be constructed of paper.

On the 19th Judge Seaman, in the United States District Court, granted an injunction against the Oconto Mfg. Company, restraining that company from making the Edison incandescent lamp, on the application of the Edison Company. The decision upholds the validity of the Edison patents in the incandescent lamp. The Oconto concern represents the combined interests which have been fighting the Edison patents.

### The Pierpoint Water-Tube Boiler.

The Pierpoint Boiler Company of Pittsburgh, of which Julian Kennedy is president and George Reeves of Niles is treasurer, are putting on the market the water-tube boiler invented by James Pierpoint. From the accompanying engravings it will be observed that the boiler consists of a series of three horizontal steam and water drums connected by expanded rows of tubes, with a similar number of water drums which are in turn connected in such a manner that a good circulation and steady steaming are attained. The grate surface is the full width of the boiler and by the baffle walls, shown in Fig. 1, the gases of combustion are conducted so as to come in direct contact with the tubes. It will also be noted that the tile do not lie flat on the different rows of tubes, thereby covering and protecting them from the action of the gases, but are supported on a special tile which in turn is only laid on every third tube, thereby allowing the other two-thirds to be entirely encircled by the flame and gases.

The feed is into the back of the boiler, the water being conducted slowly up the back bank of tubes, the object aimed at being to give ample time for precipitation to take place before the water reaches the upper drums, the vertical position of the tubes aiding the dropping of foreign matter into the lower drum. The point is made that even after long use, should any foreign matter collect on the tubes, the heat of the gases is so reduced before reaching this particular bank that it is not burnt hard, but still retains its soft plastic condition, and can readily be washed off with the hose or scraped off with any simple tool. The purification of the water before it reaches the other two banks of tubes, where the heat is greatest, is relied upon to prevent the formation of scales.

The tubes are not contracted in order to obviate priming. They are bent slightly at either end to enable them to enter true the bored holes in the tube sheets. There is no tube, however, but what can be seen through, the greatest bend being one half of their diameter, which gives a clear view through the tube. The tubes are placed in the drums in staggered rows, spaced  $\frac{1}{2}$  inch farther apart than the diameter of the tube, so that there is no tube in the boiler but what can be taken out and replaced without interfering with any other tube, and the space between the rows is such as to allow a man to work with ease.

The riveted seams on the drums of the boiler are so arranged and placed as to be out of the action of the gases, thereby avoiding a frequent element of weakness in boilers. The boilers are all hung or suspended from wrought-iron supports, so arranged that they are out of the action of the fire and act as buckstaves front and rear. The lower drums of the boiler are entirely free, thus allowing the boiler to expand and contract without throwing any strain on the boiler itself or on the brick work.

The lower drums being spaced from three to six inches apart allows soot and dirt to fall between them to the pit below, and the round surfaces of the drums themselves do not permit of any deposit accumulating there. It will be seen that the exterior surfaces of the boiler are easily kept clean.

This boiler is a quick steamer, and as it contains a large volume of water per horse-power, it has a large heat

storage capacity. It is adapted to variable work and can be driven far above its rating for a short time and will hold its steam well when firing is stopped. It is urged that this feature is particularly valuable for rolling mills and blast furnaces.

### Jacketing and Compression.

An almost elementary acquaintance with indicator diagrams shows that there is nothing like uniformity of practice among engineers in dealing with compression. Thus, we meet with diagrams in which the compression line is nearly square; while in others we

the piston. The proof is too long to reproduce here. It will be enough to say that while the expanding steam works between two limits of temperature  $t$  and  $t_1$ , the compression takes place between two limits of temperature  $t$  and  $t_2$ , in which  $t_2$  is lower than  $t_1$ . In a word, the range of temperature during compression is greater than that which obtains during expansion, and the range is greater the lower the back pressure at which compression begins. It is assumed, of course, that compression has raised the pressure at the end of the stroke to that of the incoming steam, no more and no less. Mr. Clark, by the aid of a very simple diagram,

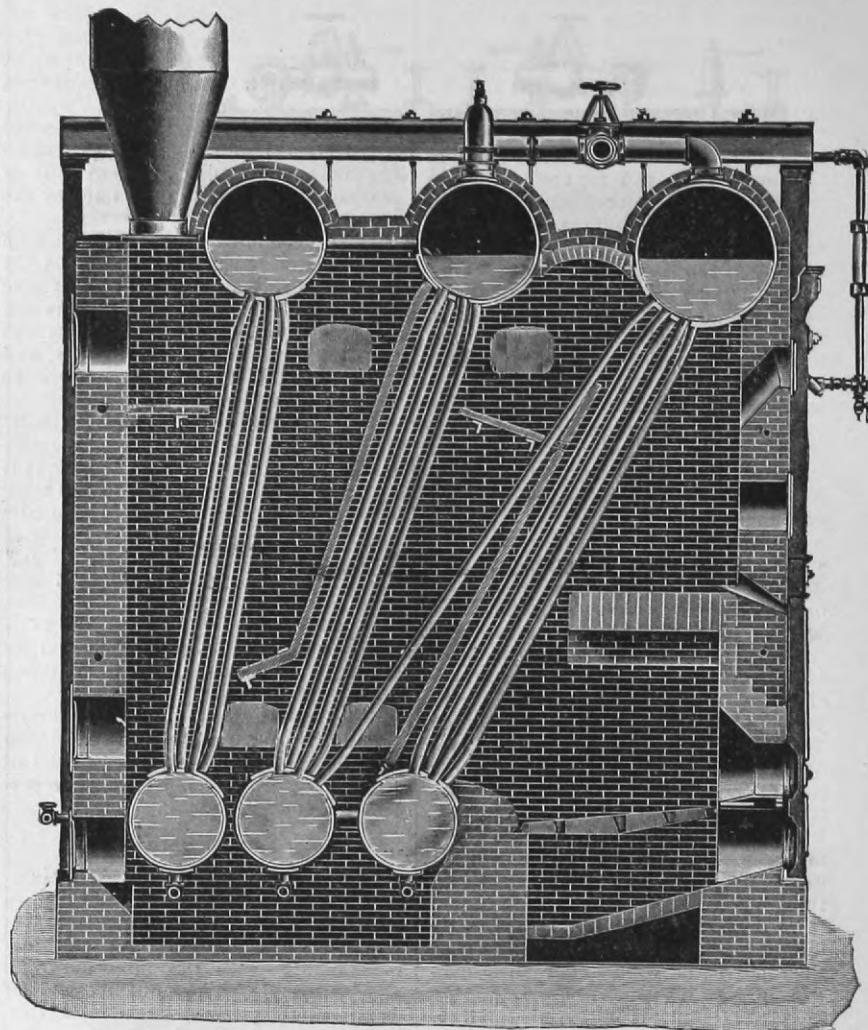


Fig. 1.—Sectional Side Elevation.

### THE PIERPOINT WATER-TUBE BOILER.

find a long sweeping curve. It is worth notice, moreover, that compression appears to exert a very small influence in reducing the weight of steam used per horse per hour. Indeed some of the most economical engines in existence have practically no compression; while others, which are certainly not economical, not only have a great deal of compression, but carry the compression line to a higher point than the boiler pressure. The *Engineer* calls attention to the fact that D. K. Clark devotes a chapter in his last book to the discussion of the means of arriving by calculation at the best amount of compression in any engine, simple or compound; and he proves in a way that has never been so lucidly done before that the work done in compressing any stated amount of steam in a cylinder is commonly greater than that which the same amount of steam can give back against

makes all this quite clear. The general conclusion at which he arrives is thus stated: "If steam be expanded in the cylinder down to the back exhaust pressure, and if the exhaust steam be so compressed into the clearance space on the return stroke that the final pressure there is equal to the initial pressure for admission, the efficiency of the steam in the cylinder is the same as if there were no clearance and no compression, but when there is a fall from the final pressure of expansion to the exhaust pressure, the opposing work of compressing a quantity sufficient when compressed to fill the clearance with steam of the initial pressure—starting from a lower pressure—is so much increased in consequence that the efficiency of the steam is reduced by it." He then goes on to show that for every engine and set of conditions there is an amount of compression which is more economical

than any other, but in all cases it must be less than will suffice to bring the compression pressure up to the initial pressure.

Rankine, it is well known, and many other engineers, held that the steam should always be compressed enough to reach the initial pressure. This is not Mr. Clark's view, and it is not that of the *Engineer*. It is based on the assumption that the work to be got out of the compressed steam during expansion will be equal to that expended upon it during compression. Mr. Clark has shown that in theory this can never be the case in any engine unless it expands down to the exhaust pressure,

pressure, although compression is going on. This is due to the fact that if there is about 30 per cent. of water present when steam is compressed it is condensed. Thus, then, we have a considerable percentage of work done in a way analogous to that which would be needed to expel the steam from the cylinder through, let us say, a loaded valve when once a certain pressure had been reached. All this must be wasted unless the liquefied steam is again evaporated to do work on the piston, but all the chances are against any such re-evaporation taking place at such temperatures and pressures that the whole of the work will reappear.

motives running at a high speed and much linked up it may reach one-half, or even more. Is one-half the steam saved? To arrive at any just conclusion on this point it is essential that the compression curve be examined. Mr. Clark, for the purpose of theory, assumes that it is hyperbolic, the pressure being doubled when the volume is halved, and so on; but we are disposed to think that this condition obtains in very few engines, for reasons which we cannot stop to specify.

And here we come to a point which should be cleared up—it well deserves investigation—namely: What is the effect of jacketing on the compression curve? We have seen that the presence of water during compression is very objectionable. But this is just the period when a jacket would be most likely to do good. It is known that jackets are in some cases of no value whatever; but is it not a fact that in all such cases the amount of compression is comparatively small? In the high-pressure jacketed cylinder of the engine tested by Mr. Crosland it is shown that in the first place the compression is very small and that the expansion curve drops down nearly to the exhaust pressure. In the Pawtucket pumping engine, which gives a horse-power for 13 62 pounds of steam per hour, and in which—as in Mr. Crosland's engine—the jackets are practically useless, there is virtually no compression, the cards being quite square in the compression corner, with the exception of a scarcely noticeable rounding. The engine which took the first prize at the Royal Agricultural Society's Newcastle Show ran with very little compression; and Mr. Paxman stated that he had found that, whether steam was or was not admitted to the jackets, the result in consumption of fuel was the same. A Belgian firm, using engines of large power with very little compression, has found—as the result of careful experiment—that the gain secured by jacketing was not worth having. The system of "regenerating" or heating the steam in the intermediate receiver of a cross-compound engine was then tried and resulted in a small percentage of loss; due, no doubt, to the condensation taking place in some extra piping. On the other hand, is it not a fact that in all engines whose jackets have proved of use there is considerable compression? Of course, on these points each engineer will have to use his own experience. Ours is all in favor of the view we take—namely, that the true value of the jacket can only be realized when there is considerable compression, and this lends additional interest to the experiments to be carried out with a jacketed locomotive by the research committee of the Institution of Mechanical Engineers.

It may be asked, what special function the jacket discharges as regards compression steam? The answer must be sought in the light of Mr. Clark's dissertation first. A great deal of work is done in compressing the steam. Whether this will or will not be returned depends mainly on the efficiency of the steam during expansion. In a word, the action with a jacket will be very much the same as though we forced a given weight of steam into a vessel in which it was heated and dried, and then allowed to expand again behind a piston. It is tolerably evident that it would do more work during expansion than was expended upon it during compression. The transfer of heat from the jacket to steam of the same, or nearly the same temperature in the cyl-

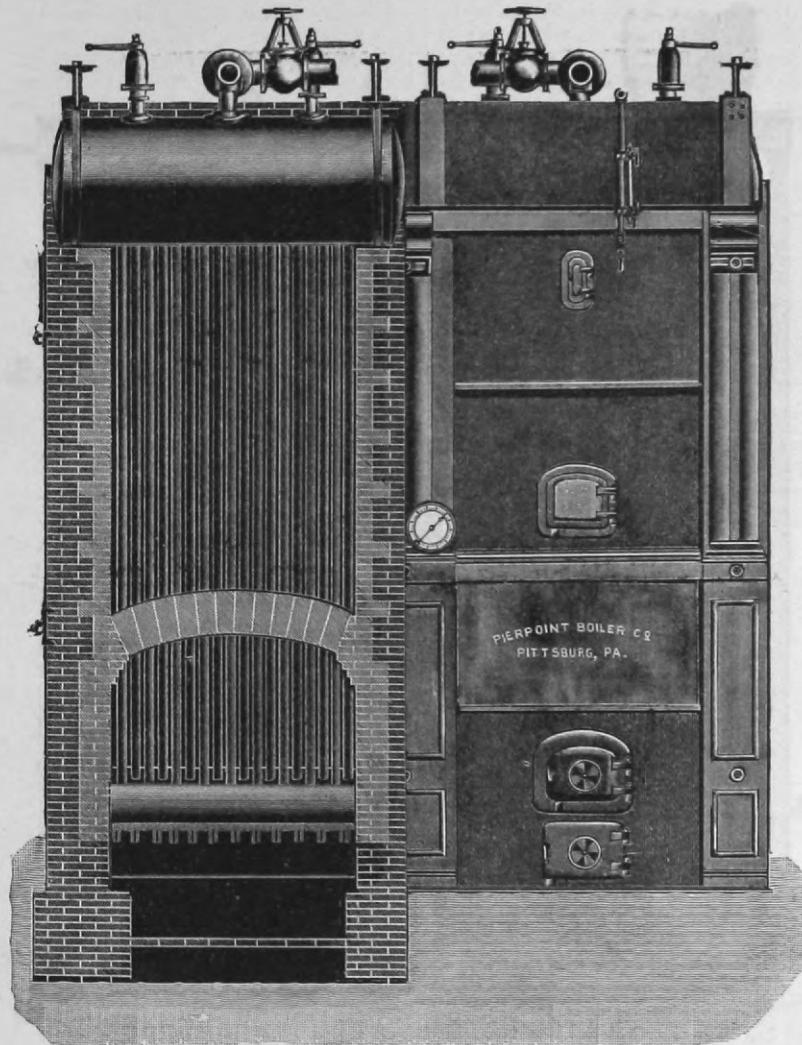


Fig. 2.—Front Elevation and Section.

#### THE PIERPOINT WATER-TUBE BOILER.

which few real steam engines ever do if they are properly loaded. But there are other aspects of the question to be considered. Thus compression is absolutely essential to prevent "knock" in high-speed engines. But leaving this fact on one side, we must remember that Mr. Clark's deductions are all based on the assumption that he is dealing with dry steam. The whole subject becomes complicated by the circumstance that the back pressure steam is seldom or never dry and that the compression curve of wet steam is a very different thing from the compression curve of dry steam. Thus, for example, we meet every now and then with diagrams in which the compression rises to a certain point. That reached, the indicator pencil moves in a straight line parallel to the atmospheric line. That is to say, there is no further rise of

A great deal has been written about the expansion curves of diagrams, and theoretical curves have been calculated on various assumptions, and then the real compared with the ideal curves; but we cannot call to mind a single instance in which the compression curve has been made a subject of investigation. If an engine works with a square compression corner, it is clear that it will take a greater quantity of steam from the boiler per stroke, other things being equal; but it is also clear that the indicated power will be greater. The area represented by compression is so much lost effective work. The question for solution is whether the loss more than balances, or does not balance, the saving effected in the admission of steam. In many cases quite one-fourth of the whole work done by the steam is expended in compression. In loco-

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inder must be slow; but during the first steps, at all events, of compression the transfer may be very rapid, and in any case the steam will find itself in contact with hot metal instead of having to warm cold metal up. It is for this reason that the true utility of the jacket must be sought in the amelioration of the phenomena of compression rather than in any help given during initial admission or subsequent expansion. Nothing short, however, of the careful examination of a number of diagrams can settle this question. It may, however, be taken as probable that jackets are of no use in engines working with very little compression.

#### The Norton Screw-Cutting Engine Lathe.

The Norton screw-cutting feature, as applied to a regular screw-cutting lathe,

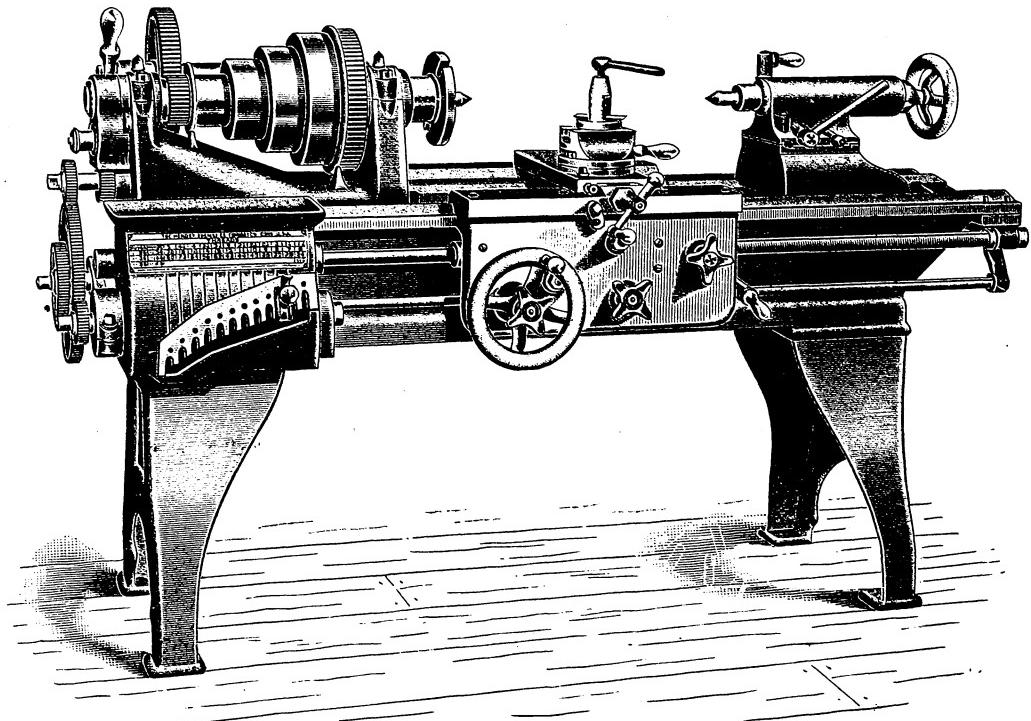
depth to receive and guide the handle and gear in line with the cone gear wanted, the thread which the combination will cut being stamped above each notch. The latch for holding the handle and gear in place is arranged to secure the handle, both in and out, entering the upper hole when in and the upper part of the notch for the handle when out. This prevents the handle being thrown out from the motion of the shaft or gears when running, and also holds the handle in position where last used, which would otherwise fall to the lower end of the slot. Thus far the device is described as only cutting the 12 regular threads from 6 to 20 (which include all the ordinary threads in daily use) and is accomplished without change, aside from the movement of the lever from one notch to the other.

The lower shaft having the same rotation as the lathe spindle, by means of equal gears on the outer end of the

countershaft. It is so arranged that it always starts into the thread at the proper place when reversed, the spindle of the lathe always running in the same direction. This handle is also used for reversing the feed when turning and is always under the hand of the operator. This lathe is made by the Hendey Machine Company of Torrington, Conn.

#### The Crash in Milwaukee.

The failure of the Douglas Furnace Company at Sharpsville, Pa., carried down the Commercial Bank at Milwaukee, Wis., on the 21st inst. The Commercial held storage warrants on pig iron sold the Sharpsville people by the Schlesinger syndicate and which the bank had discounted to the amount of \$130,000 dollars. While the officers of the bank believe these warrants to be good for their face value, in view of



THE NORTON SCREW-CUTTING ENGINE LATHE.

is shown in the accompanying engraving. It consists of the ordinary train of change gears, mounted in the form of a cone directly on the screw of the lathe and secured thereto by one spline or key, the whole being inclosed in a case or box, which at once forms the cover for the gears and the bearings at either end for the screw.

In the lower part of this box is arranged a driving shaft with bearings parallel to the screw. This shaft has a spline the full length of the inner side of the box, and has sliding upon it the driving gear (or as it is commonly termed the stud gear). This gear bears the proper relation to all the gears in the cone, to cut the regular lists of threads from 6 to 20, its position relative to the gears in the cone being controlled by the handle shown, the inner end of which is a forked casting with bearings on either side of the gear, and in an upper extension of the same fork are the bearings for an intermediate gear, which is thrown in or out of the various gears of the cone by means of the handle, as shown. The index plate on the front has notches of sufficient

shaft and regular stud of the lathe, it will be seen that changing the relation of these gears will multiply the list of threads according to the ratio of the gears in use, the index having as many rows of figures as there are changes.

The lathe here shown has but two changes, cutting from  $1\frac{1}{2}$  threads per inch to 80 threads per inch, and has one extra gear to cut  $11\frac{1}{2}$  threads per inch for steam pipe; yet, should occasion arise to cut any special thread not provided for this arrangement does not interfere with the making and using any special gear, the same as in any ordinary lathe. For feed, in turning, this device has the same advantages as for screw cutting, giving 36 distinct feeds with only two changes of gear. In daily use there are no changes of gear required for the feeds, as it makes from 30 cuts per inch to 100, with only the movements of the lever and with the two changes of gear referred to above, will make from  $7\frac{1}{2}$  cuts per inch to 400.

The handle at the right-hand side of the carriage is for reversing when cutting screws instead of reversing the

liability which they would incur in case it turned out that the warrants showed a shrinkage it was decided to close the doors. Besides the Sharpsville failure the bank was caught in the Bouton Foundry Company of Chicago and the Badger Furnace Company, which has been operating the old Minerva Furnace at Milwaukee. In each of these it lost \$15,000.

Col. H. G. Prout, editor of the *Railroad Gazette*, in a lecture before the Association of Civil Engineers of Cornell University, estimated that the annual loss from railroad accidents in the United States, due to the destruction of railroad property and the compensation for deaths and injuries, and leaving out entirely destruction of merchandise, reaches over \$12,000,000.

Collis P. Huntington has determined to dispose of his railway interests south of the Mississippi in order to devote himself more exclusively to the Southern Pacific system, in which he possesses a controlling interest.

## Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held on the evening of July 19, at 225 Dearborn street, Chicago. In addition to members, a number of visitors were in attendance. A. T. Whiting was elected temporary chairman, in the absence of the regular officers. After the dispatch of routine business, the following report was offered by the committee appointed by the chair to investigate the offer made by the Armour Institute:

GENTLEMEN: At present they have no apparatus, but say that they will put in whatever is necessary to do the work in a satisfactory manner; but they cannot present any figures as to the cost of doing the work until they know about how much work there is to be done. After a decision is reached by the association as to whether they want to go into any arrangement with a chemist, and an approximate idea is given them as to what amount of work there will be to do, the Armour Institute will submit a proposition.

Yours, very truly,  
S. WIGHAM,  
B. M. GARDNER, } Committee.  
A. T. WHITING,

Geo. M. Sargent of the Sargent Company, Chicago, and Chas. Allis of the E. P. Allis Company, Milwaukee, were nominated as candidates for the vacancy in the presidency made by the resignation of C. A. Flamondon, and the secretary was instructed to notify the members of the association of the nominations made to be voted upon at the next regular meeting.

The following new members were then elected :

Brown Bros. Mfg Company, Chicago.  
Rogers, Brown & Merwin, Chicago.  
Charles Brunner, Peru, Ill.  
Challenge Wind Mill and Feed Mill Company, Batavia, Ill.  
L. L. Graves, Streator, Ill.  
A. L. Ide & Son, Springfield, Ill.  
David Van Alstine (Sargent Company), Chicago.  
Jas. A. Gilbert (Sargent Company), Chicago.  
The J. D. Smith Foundry Supply Company, Cincinnati, Ohio.

The following paper was then read by H. O. Chute, chemist, of Chicago:

### The Chemist as a Factor in Foundry Practice.

Since this paper was asked for by the Executive Committee several articles on the same subject have appeared in the technical press, and the able address given before the Eastern association by Wm. C. Henderson, entitled "The Value of the Chemist's Service as Applied to Foundry Practice," appearing in *The Iron Age* of July 13, and which you have all doubtless read, treats the subject so thoroughly and so well that the writer of the present article decided to confine himself to a few remarks on the possible methods by which the chemist should be utilized in the foundry, feeling that all are now alive to his value and importance. To do this, a short description of the chemist's methods of work in a Bessemer steel works will be given, as illustrating a parallel manufacture and one in which the services of chemistry have been brought to the highest perfection.

With the advent of the Bessemer converter the chemist became a necessity, as its processes could never have been brought to their present perfection without his aid. Previous to this time all branches of the metallurgy of iron were supposed to be mysterious secrets, known only to a few who had inherited in some way this knowledge from their ancestors, and who by long experience had a kind of intuition as to the hidden causes of success or failure. If failure attended one effort the only escape was

by guessing the cause and experimenting to find some way to avoid the difficulty. This condition led to extreme conservatism, and the safest plan was to stick by a material and method which was known by experience to give satisfactory results. Expansion, development and improvement were prevented by the impossibility of predicting beforehand the result of a costly undertaking.

Now, however, the causes of the seemingly mysterious differences in iron and steel have been traced to the different elements contained therein, and which, on account of their small quantity, had been previously overlooked. This knowledge has enabled the manufacture of steel to be brought to a strictly scientific basis, and knowing exactly what is wanted, iron is bought on chemical specifications, and immediately on receipt of material it is tested by the chemist. This test shows exactly its quality, and the user then settles for it, and knows without a doubt exactly its suitability for the required purpose. No trial carloads are necessary, and disputes as to quality are impossible.

When the metal is blown in the converter another change takes place, and its amount and extent are determined by more chemical tests. The steel, being a final product, is tested mechanically by hammering, bending, &c., and any fault revealed immediately requires investigation by the chemist to determine its cause. It will thus be seen how closely the chemist is associated with every operation, how every action is watched and studied at the converter's mouth, how all the causes of success and failure are discovered by analyzing all the materials and all the products all the way through, and analyzing the effect of all the elements on the reactions which take place in its manufacture.

The possibility of determining beforehand and without costly experiment the suitability of material for certain purposes by knowing its chemical composition has enabled the manufacturer of steel to select from the widest possible range of raw materials the most advantageous, has enabled him to secure uniform results and has shown the way to economies which have tended to cheapen the product, enabling him to supplant largely the manufacture of wrought iron and to even threaten the field of the iron casting.

The chemist at the steel works soon necessitated a chemical supervision of the blast furnace, if the pig iron was to be always of the desired composition. This practice soon showed great advantage over the previous imperfect methods, and while furnaces making Bessemer pig iron have a chemist from necessity, many of the furnaces running on foundry iron pay strict attention to the composition of their ores, fluxes, fuels, &c., because of the superior results gained thereby and it may be said today that the furnaces are ready to furnish anything desired by the founder.

But why, asks the foundryman, if this is the case, do not the furnaces supply us with an iron exactly suited to our uses and thus avoid any necessity on our part for taking up this troublesome question? To answer this, and to throw some light on the causes of variations in iron from different localities, it will be necessary to examine into the conditions which surround the blast furnaces.

To the furnace accessible to the Lake Superior region an unlimited assortment of the richest ores are always available. But these are hauled a long distance, and by the time they are laid down at the furnace are expensive. The advantages of a rich ore lies in the less freight per ton of iron made, the less amount of fuel used, and the increased capacity of the furnace. Its disadvantages lie in the greater cost per unit of iron, and the probability that it will produce an iron lacking in silicon and hence one that will not carry much scrap and will not correct chill or shrinkage. The other elements of lake ores, such as manganese sulphur and phosphorus are usually not in sufficient quantity to affect the pig iron materially.

The furnaces near the Connellsburg coke have a cheap fuel relatively free from sulphur, and some local silicious ores and cinder. By mixing these with lake ores are produced the irons known as Ohio soft irons and American Scotch. These are well-known as being soft and strong irons, which is due to their being free from excessive amounts of sulphur, phosphorus and manganese, and having rather large quantities of silicon.

The furnaces of the South have to deal with an ore which is silicious and carries

relatively large quantities of phosphorus and a coke which usually carries more sulphur than the Connellsburg. Here, having cheap ores, fluxes and fuel, and cheap labor, they are enabled to run on a lean ore, and by using more coke and flux and keeping the furnace hot produce an iron high in silicon and known as a soft iron and a scrap carrier, but on account of its percentage of phosphorus not very strong.

The furnaces producing "local coke foundry," having high freight rates to pay on ore and fuel, use a rich ore, and with low fuel consumption and a great capacity, make an iron strong on account of its freedom from sulphur and phosphorus, but on account of its relatively low silicon not noted as a scrap carrier.

Lake Superior Charcoal, being made from a pure fuel and from especially selected ores, gives an iron particularly free from phosphorus, sulphur and silicon, and on account of its purity being very strong and its tendency to chill gives it great value in particular lines.

It will thus be seen that there are economic reasons for the production of different kinds of iron in different localities, and that to use them to the best advantage an intelligent mixing will be required. But the characteristics of iron from different localities are not always constant, differing not only with particular furnaces, but by the particular conditions at the furnace at the time of making.

The impossibility of always making an iron suitable for a particular purpose and of knowing what kind of iron would run from the furnace until it was cooled and examined led to the divorce of the furnace from the foundry business, the two businesses being formerly combined, as is shown by the fact that the superintendent of the furnace is yet called the founder.

To correct a fault of any particular iron the particular iron must be singled out, the cause of its failure determined from lack of or excess of a particular element, and this remedied by the addition of another iron having a relative excess or deficiency of the same element.

To experiment with the cupola mix till the cause is determined is both tedious and expensive, for, with six or more irons containing six varying proportions of six elements, the number of combinations which may be made before the right ore is found offers a very inviting field for the calculation of the mathematician, but their contemplation very often wearies the founder. The analysis of the casting here immediately locates the cause of the trouble, and the knowledge of the composition of the irons in the mix allows the offender to be singled out and points the remedy at the same time.

Heretofore the majority of founders have considered that the extent of their business did not warrant their employing the services of a chemist, but the present association offers a great opportunity for mutual aid in this direction by their having a laboratory for their special use, where there would always be the facilities for their individual work, where they could always consult with a specialist on the problems which are always arising, and where work of general value and interest to the trade could always be carried on and the knowledge distributed through the society. Some of the larger founders have already availed themselves of the services of a laboratory, and the results in all cases have been most satisfactory, although, for business reasons, there would naturally be no great disposition among them to herald its advantages, but some of the notable advances of late, both in improvement of quality and cheapening of product, are directly traceable to this cause.

To avail themselves of the advantages of chemistry it will be necessary for each founder to determine first just what physical qualities are required for his special line of work. This will involve physical tests, and on this subject let the following be quoted: "It must be obvious to all that the actual service to which an article is put when occupying the position for which it was made is the best conceivable test, and as the chemist's knowledge has, in the first place, been derived from his sole aim is in the last place to meet this test, it might be said that he is wholly independent of tests other than chemical ones. The very utmost which can be hoped from such tests is to determine whether a certain lot of material is good or bad." It may be also remarked in this connection that the founder knows pretty well what he wants in this respect, the main problem being the best and cheapest method of getting it.

The writer wishes to throw no discredit

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on any physical tests, recognizing their value from a scientific standpoint and in connection with chemical analysis. But of what use is an elaborate system of physical tests alone which reveal nothing for future guidance? If the product is thus tested it reveals nothing as to where the error lies in the mixture, and if the different irons are thus treated, besides the error caused by dissimilar treatment from what would be received in the cupola, there must always be made the false assumption that the physical qualities of an iron would always be transferred to the mixture, the fallacy of which is easily shown by melting a ferro-silicon and white iron together, both being hard and brittle and obtaining a very soft casting as the result.

As to what chemical compositions will give the best results, the requisites are so varied, depending on the uses to which an article is to be put, that probably the easiest way is to select some of the best specimens and some of the worst, and by analysis determine what elements are required and what to avoid. With these factors determined once for all, there remains the constant attention that is necessary to always know what elements and their proportions are in stock and the ever-varying factors of the composition of fuel, the effect of treatment and others which will constantly arise.

Another thing essential is for the founder and the chemist to get better acquainted and understand each other better. The founder is liable to regard the chemist as an upstart who tries to teach him his business, and the chemist is apt to forget that he deals with but one of the numerous factors which are necessary in the production of good castings, and that without the practical knowledge of the founder as to the handling of the iron, the running of the cupola and the other things necessary in the foundry, the knowledge of chemistry is of no avail. But in this day of specialists it may be conceded that more than one man is necessary to make the best castings.

Finally comes the question, "Will it pay?" The certainty of getting just what is wanted or the ability to use anything which is offered cheap without costly experiment must count for something, and the freedom from attachment to some brands or names which are now paid for at 25 cents to \$1 per ton will be somewhat of a compensation. The lessening of the amount of spoiled castings might also be enumerated. And, finally, the broadening field for the iron casting, through the improvement in quality and uniformity of products, which field seems at present to be narrowing, will be of such vast advantage to the trade that the wonder will be expressed that the advantages were not embraced sooner.

#### Discussion.

After the reading of the paper, Chairman Whiting called on Dr. N. B. Rising of the University of California for some remarks.

J. H. Warden indorsed the sentiments expressed in the paper just read and gave quite a breezy account of haphazard methods too often followed by foundrymen in making up their mixtures for the cupola. Geo. H. Ellis called attention to the importance of the malleable foundry trade, which is a line requiring constant chemical work to get best results. A. L. Ide and A. M. Thompson made brief remarks, and J. P. Gilbert gave some account of the methods followed by the Sargent Company. T. A. Wigham said that the paper had been somewhat of a surprise in the statements made, and he proposed that the discussion be continued at the next meeting, as it is of great value. The members could then ask Mr. Chute some questions, and try to get back at him.

Secretary Gardner then introduced Professor Cook of the Armour Institute, who made the following statement: The Armour Institute intends equipping the laboratory for its own business in metallurgical work, chemical work and physical work. If we can make arrangements with your association to undertake the work, whereby we would know we were not investing a great deal of money and have no returns, we

would be perfectly willing to talk with you so as to know the kind of work you wished done and the amount of work. At the next meeting, if satisfactory, we would be willing to submit a proposition to your association. I might state here in regard to physical work in the testing of metals that it is not used so very much without chemical work, and the chemical work is not used without the physical, and they are of no use without metallurgical work. The three are combined together, and with the three you can form results that are advantageous. I am not here, however, to speak for Dr. Haupt or Professor Foy. Dr. Haupt has charge of the metallurgical and Professor Foy of the chemical department. I have a letter here from Dr. Haupt which I will read:

The metallurgical department of Armour Institute is ready to aid foundrymen in all investigations of a scientific nature they may require. We intend, when you make the demand on us for the information, to erect furnaces for the smelting of ore and alloys, giving you in an experimental way the results of the fusion of different alloys and metals, and to determine for you the best practical and economical methods for eliminating phosphorus, sulphur and other objectionable elements from the products. We will make analyses of ores, coals, slags and fluxes, and give you practical results. (Incuse a few circulars that will explain themselves.) In fine, we propose to make this department a bureau of practical information and consultation for the foundrymen of this region.

J. A. Penton said: "The paper read by Mr. Chute was the finest thing of the kind I have ever seen or heard. There were more practical ideas in it for the foundryman than I have ever known in so small a space. There is too little known of it among foundrymen. Regarding the matter of the Armour Institute it appears to me that our association being but an infant as yet we hardly know what we want to do and the Institute is also hardly in a position to make a proposition, but I think we have every reason to appreciate the kind offer made by the Armour Institute."

Secretary Gardner then read letters received from H. O. Chute of Chicago, H. L. Hollis & Co. of Chicago and Cleveland, and the University of Wisconsin at Madison, making propositions to perform chemical analyses and make physical tests for the members of the association. These letters, together with the communication of the Armour Institute, were referred to the Executive Committee to be reported upon at the next meeting of the association.

Mr. Penton then laid before the meeting four very fine specimens of artistic casting by the Yale & Towne Mfg. Company, as done in their foundry at Stamford, Conn. Two of these castings were Bower-Barfield and two were left as they came from the sand. All are plate shaped but constructed in delicate open work, making them suitable for card receivers. One pattern is 60 years and the other 40 years old. Two of them were donated to the association, and the secretary was directed to acknowledge the courtesy. After a vote of thanks to Mr. Chute for his paper the meeting adjourned until the evening of the third Wednesday in August.

Judge Coxe of the United States Circuit Court in New York handed down last week an important decision in the case of the American Cable Railway Company against the Mayors, Aldermen and Commonalty of the cities of New York and Brooklyn. The claim made by the company is that a patent was granted in 1883 to Daniel J. Miller,

who was the first inventor of the combined cable support or carrying pulley and cable in the construction of cable railway. This patent, which is now held by the American Cable Railway Company, has, it is claimed, been infringed by the owners of the railway operating on the New York and Brooklyn bridge. Judge Coxe holds that the claim is valid and that the American Cable Railway Company has the entire right to the cable in the United States, and has the right to recover damages for past infringements. This decision affects numbers of cable roads throughout the country. Judge Coxe further appointed a referee to assess the amount of damages, and granted an injunction restraining the operation of the cable on the bridge. It is thought that this decision will not, however, have the effect of immediately restraining the use of the cable in connection with the bridge railway. An appeal will certainly be made to the United States Supreme Court, which will act as a stay, so that there is no danger of the bridge cars being stopped in the near future. It is said that a bond of \$5000 has been given to insure indemnification of the plaintiffs should their case be sustained by the higher court.

#### Fast Foreign Cruisers.

In view of the interest taken in the speed trial of the United States armored cruiser "New York," the following tabular statement giving the forced-draft performance of some foreign cruisers of high speed, as recorded in *Engineering*, is opportune:

Navy.	Ship.	Displacement. Tons.	Speed. Knots.	Indicated horse-power.
Argentine.	"25 de Mayo" . . . . .	3,200	22.42	13,800
Argentine.	"9 de Julio" . . . . .	3,500	22.74	14,500
British.	"Medusa" . . . . .	2,800	19.9	10,000
British.	"Blenheim" . . . . .	9,000	21.6	21,400
British.	"Edgar" . . . . .	7,350	20.97	12,550
British.	"Latona" . . . . .	3,330	20.5	9,000
French.	"Surcouf" . . . . .	1,850	20.51	6,287
French.	"Forbin" . . . . .	1,850	20.64	.....
French.	"Cécille" . . . . .	5,670	19.44	10,680
Italian.	"Piemonte" . . . . .	2,500	22.3	12,700
Spanish.	"Reina Regente" . . . . .	4,800	20.6	11,500

The foregoing speeds were made with forced draft. Omitting the "Forbin" and the "Cécille," for which the information is not available, these vessels have made the following speeds with natural draft:

Ship.	Speed. Knots.	I. H. P.
"25 de Mayo" . . . . .	21.24	8,700
"9 de Julio" . . . . .	22.03	10,000
"Medusa" . . . . .	18.00	6,300
"Blenheim" . . . . .	20.4	14,900
"Edgar" . . . . .	19.25	10,200
"Latona" . . . . .	19.35	7,400
"Surcouf" . . . . .	17.3	3,508
"Piemonte" . . . . .	20.4	7,000
"Reina Regente" . . . . .	18.68	.....

The remarkable records made under forced draft by the Argentine cruisers "25 de Mayo" and "9 de Julio" and by the Italian cruiser "Piemonte" render it worthy of note that all three of them were built by the same English firm, that of Sir W. G. Armstrong, Mitchell & Co. The "25 de Mayo" was launched in 1890, and the "9 de Julio," of the same general type, in 1892, while the "Piemonte" was launched in 1888. These three vessels are all protected cruisers.

Of the British vessels named, the "Medusa" was launched in 1888, and the other three in 1890. The "Blenheim" is a sister ship of the "Blake"

which participated in the Columbian Naval Review in New York Harbor.

The French cruisers "Surcouf," "Forbin" and "Cécille" were all launched in 1888, and the Spanish cruiser "Reina Regente" was launched in 1887.

The Argentine cruiser "9 de Julio" and the Spanish cruiser "Reina Regente" both took part in the recent Naval Review.

#### Angle Iron Shearing Machine.

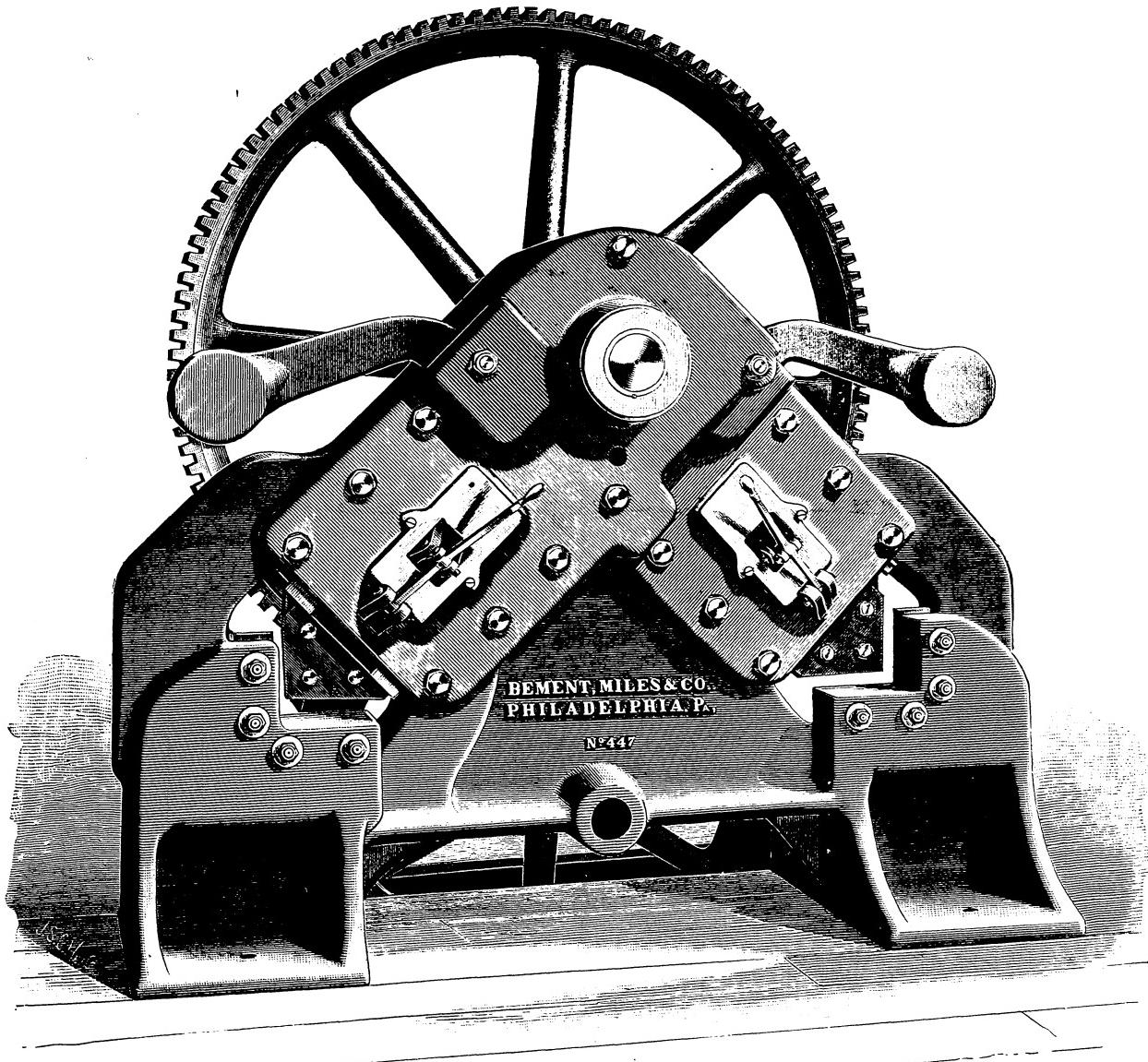
Bement, Miles & Co. of Philadelphia build a machine which shears angle iron

#### A Proposal to Raise the "Victoria."

Signor Balsamello, the Italian inventor of the "Balla Nautica," a submarine vessel with which several successful experiments were performed lately at Civita Vecchia, in the presence of a committee appointed by the Italian Government, declares that by the aid of his invention he could float the battleship "Victoria," recently sunk off the coast of Syria, at a cost of less than \$200,000. He claims that with the "Balla Nautica" he can make arrangements for raising weights far exceeding that of the submerged vessel. The

tated. The actual operation of hoisting with the assistance of powerful cranes and heavy lighters is a comparatively easy matter. Should Signor Balsamello's offer be accepted by the British Government, it will be very interesting to observe the result of his effort, and as the cost of the ill-fated "Victoria" was in the neighborhood of \$3,500,000 the expenditure of the comparatively small sum named as the price of her recovery would be well laid out.

There are no trades unions in India. The workmen are, however, said to have in many instances a common under-



THE BEMENT, MILES ANGLE IRON SHEARING MACHINE.

6 by 8 inches, right and left. It is provided with tight and loose pulleys and the heads are started and stopped by independent clutch on the gear shaft, operated by hand lever. The heads receive their movement from an eccentric shaft through vibrating pintles, the points of which, and the blocks on which they rest, are of hardened steel. The driving gear runs continuously, the stroke of either head being made by the insertion of the steel block by means of either of the hand levers shown. The heads are counterweighted and always stop at the top of the stroke. The machine is built unusually heavy in all parts and is designed for doing work of the severest kind.

preparations and placing of grapnels and chains round the hull would take a month, and would be performed by the crew of the submarine ship, which, it is said, has already maneuvered successfully at depths beyond that in which the "Victoria" lies. The bringing up of the vessel to the surface would, Signor Balsamello calculates, take but two days. There is a smack of Jules Verne about the idea; but if, as is claimed, the crew of the submarine boat can operate with facility at the depth of 480 feet, which is about that of the water in which the "Victoria" rests, the greatest difficulty in such operations, namely, that of slinging the mass with the aid of divers, will be considerably facil-

standing, an unnamed and unwritten bond of union, peculiar to themselves, by which the labor remuneration in various trades is generally regulated. No strikes or lockouts of general importance have occurred in India, and nothing in the nature of disputes involving organized action on a large scale between labor and capital.

Thomas A. Edison thinks the practical speed limit on the horizon of electrical locomotion will be about 150 miles an hour. Before moving heavy trains by electricity he believes that we shall shoot our mail through the country by some electrical device—of trolleyphage construction, in all probability.

## World's Fair Notes.

### The Jurors.

Full information regarding World's Fair Judges of awards is not yet accessible. The following jurors for Manufacturers Department, nominated in executive session sometime ago, were confirmed for the groups named on the 21st inst.:

*Glass and Glassware.*—R. M. Atwater, Syracuse, N. Y.; John Corcoran, Wheeling, W. Va.; Charles Colne, Brooklyn, N. Y.

*Chemical Products.*—Professor Appleton, John Brown University, Providence, R. I.; Prof. C. F. Chandler, Columbia College, New York; Major King, U. S. A., Willets Point, N. Y.; George E. Lorenz, Toledo; William McMurtie, New York City; Prof. Albert Prescott, Ann Arbor, Mich.; Prof. W. B. Rising, Berkeley, Cal.; Prof. Ira Remsen, Johns Hopkins University, Baltimore; Prof. S. P. Sharpless, Boston; William Simpson, Raleigh, N. C.; Prof. Edgar F. Smith, University of Pennsylvania, Philadelphia; Waldron Sharpleigh, Gloucester, N. J.; Marcus Salmon Benjamin, New York; J. D. Humphrey, Huntsville Ala.

*Paints and Dyes.*—J. B. Brewster, New York City; Dr. M. H. Drummond, New York City.

*Ceramics and Mosaics.*—Dr. W. S. Bigelow, Boston; Walter S. Lenox, Trenton, N. J.; Professor Morse, Boston; Henry Loomis Nelson, Washington, D. C.; Salomon P. Stratton, Boston.

*Plumbing Materials.*—H. E. Bullock, Illinois; W. E. Clow, Chicago; Morton Y. Cady, Moline, Ill.; Hugh H. Hanrah, Indianapolis.

*Cooking and Heating Apparatus.*—Romyn Hitchcock, Washington, D. C.

*Monuments and Undertakers' Supplies.*—Dr. J. Henry Jackson, Barre, Vt.; L. G. Laurean, New York City; Charles H. Morgan, Worcester, Mass.

*Scales.*—Samuel H. Howard, Caledonia Springs, Vt.

*Wrought Iron and Thin Metal Goods.*—J. L. Ketcham, Indianapolis; G. W. West, Birmingham, Ala.

*Gold and Silver Ware.*—David Pell Secor, Chicago.

*Stained Glass in Decoration.*—John C. Carpenter, Kansas; John La Farge, Judge A. B. Quinton, Topeka, Kan.

*Carvings in Various Materials.*—A. H. Dainty, Chicago.

*Materials of War, Hunting and Sporting Goods.*—W. C. Dodge, Washington, D. C.

*Safes, Hardware and Cutlery.*—John Griffith, Philadelphia; E. R. Strauss, Chicago.

*Typewriters, Paper and Stationery.*—Charles L. Hamilton, Philadelphia; C. A. Lownsberry, North Dakota; E. Morgan, Springfield, Mass.; William O'Shea, Lincoln, Neb.

*Judges Named [but Not Assigned to a Particular Group].*—Prof. E. C. Carpenter, Ithaca, N. Y.; Hounton Chapman, Uniontown, Ky.; Ernst Fenelosa, Boston; F. D. Higbee, Chicago; H. H. Jackman, Kansas; G. W. Johnston, Hastings, Neb.; H. I. Kimball, Atlanta, Ga.; Russell Sturgis, New York City; Charles A. Schaeffer, Iowa City, Iowa; John W. A. Strickland, New York City; L. W. Williams, Oak Cliff, Texas; Robert D. Williams, Albany, N. Y.

Although some of the judges are already at work inspecting and comparing exhibits, the full list will not be

given to the public until some time this week.

### Stoves Withdrawn from Awards.

We are informed that the following well-known stove houses have written to the World's Fair authorities declining to have their goods examined for premium or award: Rathbone, Sard & Co., Peninsular Stove Company, Buck's Stove & Range Company, the Michigan Stove Company, the Fuller-Warren Company, Cribben, Sexton & Co., Chicago Stove Works, Wm. Resor & Co., Orr, Painter & Co., the Collins & Burgie Company, Abendroth Bros., Thomas, Roberts, Stevenson Company, Co-operative Foundry Company of Rochester, Wm. Miller Range & Furnace Company, Estate of P. D. Beckwith, Richardson & Boynton Co., The Wilcox Water Heater Co. This comprises nearly all the American stove manufacturers exhibiting at the Fair.

### To Aid Firemen's Families.

The Michigan Stove Company, through Frederic W. Gardner, manager, have made the following very liberal proposition to President Higinbotham of the exposition: "Under our 'Mammoth-Garland' in Section O, Manufacturers Building, are shown the highest cost and highest finished Garland cooking range and heating stove ever manufactured. These we propose to donate for the benefit of the families of the firemen who lost their lives in the recent disaster, and it is our desire to dispose of them by lot, delivering the goods at the close of the exposition. It is our intention to realize several thousand dollars from the sale of tickets, and if this suggestion meets with your approval we request that you send us the proper authority to allow our representative to sell consecutively numbered tickets, the proceeds of which will be promptly turned over to you."

### The Judges Organize.

The judges met on the 15th inst. to arrange for the work of examining exhibits and making awards. Those appointed for Mines and Mining held their meeting in the reading room of that building. About forty members were present. Prof. J. C. White, Professor of Geology and Mineralogy in the University of West Virginia, was elected president. The matter of selecting two vice presidents was left to the foreign jurors, to report the names of two of their number at 2 o'clock Monday afternoon. Joseph D. Weeks of Pittsburgh, Pa., was chosen secretary. He will be given a paid clerk, upon whom the burden of the clerical work connected with the office will fall.

The departmental committee for machinery met in its room at 1 o'clock, in the east gallery of Machinery Hall. The following judges were present:

George H. Barrus, Boston; Prof. Lewis S. Robe, Pennsylvania State College; O. E. Smith, Norfolk, Va.; William Sooy Smith Chicago; R. H. Thurston, Ithaca, N.Y.; W. C. Lamont, Bucyrus, Ohio; Marcelius Gould, Manchester, N. H.; Frank P. Holt, Laconia, N. H.; William C. Margodaut, Hamilton, Ohio; Thomas R. Pickering, Portland, Conn.; Francis J. Reiss, Evansville, Ind.; A. J. Monovale, Washington, D. C.; Prof. Jones, Adams, Mass.; John A. Roche, Chicago; James Denton, Stevens Institute, Hoboken, N. J.; L. C. Billings, William Y. Young, Medford, N. H.

The committee elected John A. Roche chairman and P. A. Bloom vice-

chairman, and then adjourned to 11 o'clock Monday.

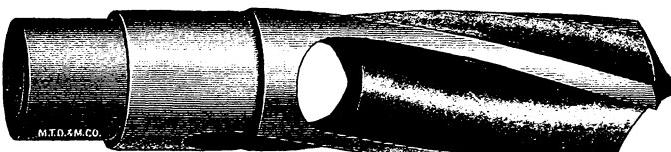
The judges of the section covered by exhibits in the Manufactures and Liberal Arts Building met in a committee room in that building. It was decided to make a division of the work here, and two chairmen were designated—Dr. Buerne, in charge of the Artistic Manufactures and H. I. Kimball in charge of Commercial and Economic Manufactures. Mr. Kimball, is from Atlanta, Ga., and was the director general of the Atlanta exposition. A. B. Kendrick of Boston was elected secretary pro tem. An adjournment was then taken to Monday to receive specific instructions with regard to exhibits to be examined.

### The Morse Twist Drill & Machine Company

of New Bedford, Mass., present a very complete and varied display of the several lines of regular and special tools made by them. The exhibit contains nothing of a problematical or experimental character. All articles, including those of special design, are duplicates of such as have been made to fill orders, and which have been satisfactorily used for the desired purpose. In all points of material and workmanship the goods represent the regular commercial quality. A unique and interesting feature of the display is the identical showcase and articles (the latter retaining their original arrangement) constituting the company's exhibit at the Centennial. Nothing in the collection has been "fixed up" for the present occasion, and the condition of the tools, after the lapse of over 17 years' exposure to atmospheric influences, makes a good showing for the excellence and durability of their finish; while, by comparison with the more modern styles comprising the balance of the exhibit, an excellent criterion of the progress made during this period is presented—which, by the way, notwithstanding the great perfection of the latest productions, is by no means discreditable to Centennial times. The somewhat popular idea of looking back to the latter period as one in which mechanical appliances were crude and imperfect as compared with the present is certainly not borne out by this exposition of relative perfection, and even to the most discriminating observer the Centennial case cannot fail to be a matter of considerable surprise, as indicative of this fact. The several cases containing the main portion of the display are so arranged as to give to each article its full value as to prominence, while at the same time the symmetrical grouping has not been sacrificed. But one sample of each kind of article is shown, the only duplicates being in case of such as contain some modifications in the different sizes. In order to enable interested visitors to obtain a more complete understanding of the recently improved tools than would be possible by simply viewing them through the glass of the principal showcases, a special case has been placed in a convenient position, in which is a full line of samples which may be freely handled and inspected, without any compunctions as to spoiling their shine by perspiring fingers. In the regular lines of straight, groove and twist drills, a full set is shown, ranging in the ordinary variations of sizes, from 0.0135 to 5 inches diameter. These include both right and left hand twists, and all the different styles of shanks and points, and in the larger sizes is shown the improved method of relieving or

supplementing the frictional grip of the taper shank by means of a longitudinal key permanently set in the latter and fitted to a corresponding key way in the socket. All the different varieties of standard styles of reamers are represented by one or more sizes of each. These include the fluted standard hand reamer, both solid and adjustable; fluted and rose chucking reamers; locomotive, bridge and pin taper reamers, in two patterns, for roughing and finishing—the former being relieved by a spiral groove or screw thread cut across the teeth for the entire length. There are also several styles of fluted and rose shell reamers. In taps and dies the extreme sizes of all of the different styles are shown, including standard, machine

paratively short, and in place of the usual shank, it is provided with a short threaded portion of smaller diameter than that of the drill. About half way up from the point the twist grooves are merged into a central opening, through which the chips are discharged. By using a shank made of wrought iron pipe, or any other form of tube, which is screwed to the threaded end of the drill, any depth of hole may be drilled—the chips finding vent through the pipe, which also affords means of lubrication. The three-grooved chucking reamer, Fig. 2, is shown in several sizes, the largest being of 3 inches diameter by 56 inches long. By means of the spiral grooves, similar to those of the twist drill, a large amount of



*Fig. 1.—Hollow Twist Drill.*

and pipe patterns; the former of the full V, Franklin Institute and Whitworth threads. The larger sizes of pipe taps are made with solid body and inserted chasers. The company have for some time past been engaged in perfecting a full line of milling cutters, including many different sizes of straight and angular faces, as well as such curved and special shapes as is practicable to carry in regular stock. The cutters are made both solid and with inserted teeth. A valuable improvement in cutters desired for use in gangs or combinations of two or more consists of making them interlocking by means of shallow lug clutches cut on one or both ends—the latter being accurately spaced and of uniform relation to the teeth so as to render them universally interchangeable. By this method of interlocking the teeth a practically continuous face is obtained, which is, in effect, equivalent to the action of a single cutter, and is especially valuable in slabbing wide surfaces. The large display of these tools makes them a prominent feature

bearing surface is obtained, which effectively guides the tool in reaming long holes, and renders the latter perfectly true and straight, regardless of irregularities in the drilling or inequality of material. A smaller size of hand reamer is shown, which is especially adapted for use in straightening such holes. Its design is somewhat novel, being, in fact, but "half a reamer," as the teeth are cut on one side only, leaving the opposite side blank to act as a guide and also preventing the possibility of cutting above the size. The only machine exhibited is the Morse twist drill grinder, arranged for sizes ranging from  $\frac{1}{2}$  to 2 inches diameter. The location of this exhibit is in Section 29, Column L 50, at the extreme west end of Machinery Hall Annex.

The great dam across the Colorado River, at Austin, Texas, which was completed last month, is one of the most notable of recent engineering enterprises. This dam holds back so great a body of water that a lake twenty-four



*Fig. 2.—Three-Grooved Chucking Reamer.*

of the exhibit. Beach drill chucks are shown in all sizes made, including capacities from 0 to  $\frac{1}{2}$  inch diameter. Among the special tools shown may be mentioned the following: A drill of 3 inches diameter, 56 inches long, designed for drilling deep holes, is provided with two extra grooves, in which are buried copper pipes of  $\frac{1}{2}$ -inch diameter, by means of which oil may be fed to the cutting edges at any depth without withdrawing the drill. This not only insures proper cutting of the tool, but also facilitates the free discharge of chips by the grooves. The latter are cut "twist" for about one-fifth of the length from the point, and for the remaining distance are made straight. Several sizes of hollow twist drills, Fig. 1, are shown, which, as seen by reference to the cut, are of decidedly novel design. The body of the tool is made com-

miles long has been formed from what was formerly a river flowing between high banks. The cost of the work, which was carried out by J. P. Frizell of Boston was \$607,927, raised by bonds on the city. It supplies a water system with a storage capacity of 100,000,000 gallons for the city of Austin; and turbine wheels developing more than 14,000 horse-power, furnish a complete electrical system, including lighting, street railway purposes and power for manufacturing works. This power will be leased by the city in such amounts as are desired. It is desired to make Austin a manufacturing city, and recent advices state that several factories are already in process of erection which will receive their motive power directly from the great body of water which is controlled by this triumph of modern engineering ability.

## The Estimation of Chromium in Steel and Iron.

BY W. P. BARBA,

Chemist Midvale Steel Company, Philadelphia.

Owing to the rapidly increasing importance of the alloys of iron and chromium, an accurate technical method for the estimation of chromium in such alloys is very much to be desired. The writer has found most of the methods heretofore in use to consume much time and attention, the operations also being in many cases tedious in the extreme. The method of Wm. Galbraith offered a rapid volumetric determination, which was tried with success, so far as results were concerned, but the difficulty of entirely decomposing the potassium permanganate by boiling alone was at once apparent. The large amount of manganese oxide to be dealt with was another objection. All of the manganese of the permanganate used to oxidize the ferrous sulphate is precipitated as oxide on the addition of the excess of permanganate necessary to oxidize the chromium to chromic acid. In a paper read before the British Iron and Steel Institute at their spring meeting this year, Mr. Galbraith explains the use of sodium hydrate as a means of completely extracting the chromium from the iron. In order to completely decompose the excess of permanganate and manganese, he directs that the acid solution be boiled till the precipitated oxides of manganese are black, when the subsequent addition of an excess of sodium hydrate will extract the chromium as sodium chromate. This means of decomposing the permanganate was found to be tedious and uncertain, long boiling even being sometimes ineffectual.

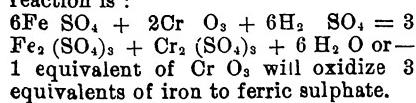
It was to avoid this and to shorten the process that a series of experiments was undertaken which resulted in the following modifications of Galbraith's process.

After solution of the steel or iron, in sulphuric acid, nitric acid is added to just oxidize the ferrous sulphate, then the excess of permanganate followed by a short period of boiling. Then an addition of ammonia to excess will rapidly and completely decompose the permanganate, as will be seen from the discharging of its color.

The method in detail is as follows: Weigh out 1.25 grams of steel (1-3 per cent. chrome) and dissolve in 20 c. cm. H<sub>2</sub>SO<sub>4</sub> sp. gr. 1.20. When the solution is completely oxidized with nitric acid, add drop by drop. Five c. cm. of dilute acid (1.20 sp. gr.) will be sufficient. Boil to remove all nitrous fumes and add hot water to bring the volume to 150 c. cm.; add, from a pipette, 5 c. cm. of a saturated solution of postassium permanganate and boil briskly for 15 to 20 minutes; remove from the plate, wash down the sides of the beaker to remove all permanganate, and add 25 c. cm. strong ammonia down the side of the beaker; shake well and replace on the cooler part of the plate, to avoid "bumping" of the solution, of which there is some danger if the heat be raised too rapidly; shake occasionally and digest for about 15 minutes, or until the permanganate is all decomposed, then add cautiously 20 c. cm. dilute sulphuric acid, sp. gr. 1.58, and bring gently to boiling. Cool the solution and pour into a graduated 250 c. cm. flask. Make up to mark with cold

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water, and mix well by pouring into a dry beaker, back and forth a few times, till thoroughly mixed. Allow to settle somewhat—they need not be clear—and filter through superposed funnels, with close, hard, dry filters, into a dry beaker; measure off 200 c. cm. (equating 1 gram sample) of the clear filtrate, and titrate by adding a known excess of ferrous sulphate, and determining the excess by standard permanganate. The reaction is:



Therefore, if the value of the permanganate in metallic iron be known, and consequently that of the ferrous sulphate, the amount of iron oxidized by the chromic acid can readily be found, then, as

$$\frac{3\text{Fe} + 1\text{Cr O}_3}{168} : : \left\{ \begin{array}{l} \text{The value of} \\ \text{the Fe SO}_4 \\ \text{oxidized by} \\ \text{the Cr O}_3 \text{ in} \\ \text{metallic iron} \end{array} \right\} : : \left\{ \begin{array}{l} \text{To its} \\ \text{value} \\ \text{in} \\ \text{chromium} \end{array} \right\}$$

or if the weight of iron oxidized by the chromic acid be multiplied by  $\frac{52.13}{168} = 0.3103$  the weight of chromium will be apparent.

To test the accuracy of the method 1.25 grams of steel carrying no chromium were taken and standard solution potassium bichromate added, and the method proceeded with. The ferrous sulphate formed by the solutions of the steel of course at once reduced the  $\text{K}_2\text{Cr}_2\text{O}_7$  to  $\text{Cr}_2(\text{SO}_4)_3$ , just the condition of a chrome steel analysis. The results were:

Cr added.	Cr found. Difference.
Grams.	Grams.
0.1716	0.1702 - 0.0014
0.1716	0.1742 + 0.0026
0.1716	0.1720 + 0.0004
0.1721	0.1721 + 0.0000
0.3442	0.3440 - 0.0002
Average difference.....	
	+ 0.0014

Steels were analyzed as follows, showing agreement of results of practice:

Sample A.	Sample B.	Sample C.
0.920	0.901	0.825
0.920	0.901	0.827
0.924	0.903	0.825

Sample analyzed by a well-known chemist using another method gave: Cr. 1.069. By new method 1.090

Fearing the effect of an excess of nitric acid on the ferrous sulphate, if carried through the process, I took three samples of 1.25-gram steel carrying no chromium and after adding standard bichromate solution, carried the method to the point where the ferrous sulphate is oxidized with nitric acid, after which were added 5-10-10-c. cm. strong nitric acid, and the method proceeded with as usual.

Cr. added.	Cr. found.
0.01716 gram, 5 cc acid	0.01716 gram.
0.01716 gram, 10 cc acid	0.01716 gram.
0.01716 gram, 10 cc acid	0.01707 gram.

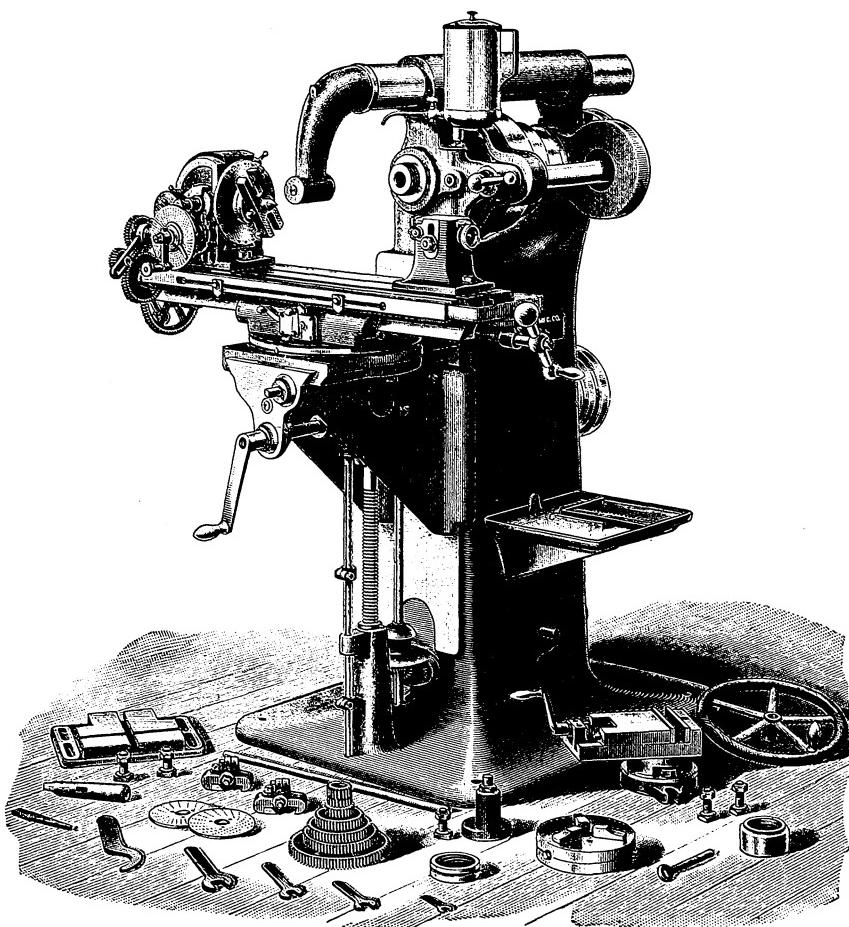
Showing that in a cold, dilute solution (250 c. cm.) the excess of nitric acid would not oxidize the ferrous sulphate. The method is easily worked, the directions given covering every point, and the writer hopes that it will be found useful to the iron works chemist, of whom more and more work and greater accuracy is expected with each improvement in metallurgy.

Baltimore has now nearly 250 miles of electric and cable roads in operation or under construction, all of which have been introduced within the last three years. Her suburban development is rapidly increasing.

### The Brown & Sharpe Universal Milling Machine.

The Brown & Sharpe Mfg. Company of Providence, R. I., are exhibiting at the World's Fair a line of five new milling machines which form a part of their exhibit of sixteen milling machines. As a type of the series we illustrate the No. 2, 20½-inch longitudinal feed by 6½-inch transverse movement, by 17½-inches, the distance which the table can be lowered from the center of the spindle. While it has all the movements of the plain machine, built for so many years by the same firm, it has arrangement to feed the table automatically at an angle to the axis of the

The table, including oil pans and channels, is 35½ inches long, 8 inches wide, has a working surface 32 x 6½ inches, 2 T-slots ½-inch wide, a transverse movement of 6½ inches and can be lowered 17½ inches from center of spindle. The saddle, which carries the table, pivots in the clamp bed and is rigidly clamped to it by three bolts, which slide in circular slots and allow the table to be set at any angle up to 45°, each way from zero. The saddle and knee are clamped by fixed handles, thus dispensing with wrenches. The knee can be moved vertically 17½ inches, and has a stop rod with sliding collars, which may be quickly set at any desired point.



THE BROWN & SHARPE NO. 2 UNIVERSAL MILLING MACHINE.

spindle, and has the spiral head so made and connected with the feed screw that a positive rotary movement may be given to the work. New features have been introduced in connection with the feed, the spiral head and the foot stock.

The spindle has a hole its entire length and runs in bronze boxes provided with means of compensation for wear. The front end is threaded and has a hole fitted for arbors with taper ½ inch per foot and 1.05 inches diameter at the small end. The cone has three steps, the largest 10 inches diameter, for 3-inch belt and is back geared, giving six changes of speed. The overhanging arm has an adjustable center, and can be reversed to receive an attachment, turned out of the way, or removed. The distance from the center of the spindle to the arm is 5½ inches, and the greatest distance from end of the spindle to the center in arm is 14 inches.

The feed of table, 20½ inches, is automatic in either direction and can be changed by a simple movement of a lever on the front of the saddle, and as it is driven from the center it can be used with table clamped at an angle to the axis of the spindle. There are 12 changes of feed varying from 0.005 to 0.147 inch to one revolution of spindle. The table may be moved by hand from either end, as at each end a handle is provided for this purpose. Adjustable dials graduated to read to thousandths of an inch indicate the longitudinal, transverse and vertical movements of table, and a series of graduations show in degrees the angle to the axis of the spindle at which the table is set. The dials may be adjusted without the aid of wrench or screw-driver.

The spiral head has indexing mechanism by which the periphery of a piece of work may be divided into equal parts, and the velocity of the rotary motion of its spindle, or of the work,

relative to the speed of the feed screw, is regulated by change gears at the end of the table. Any spiral of the 68 provided for may be cut without interfering with the divisions obtainable from the index plates sent with the machine. A plate for rapid indexing of work into 24 or less divisions is placed directly on the spindle, and the worm which turns the spindle may be thrown quickly out of gear by a knurled knob on the back of the spiral head to allow for this direct or plain indexing. The spindle of the spiral head may be moved continuously, or through any required portion of a revolution; and by use of the raising block the spiral head may be set at any angle on the table. A taper hole 1.05 inches diameter at the small end extends through the spindle, and is fitted to receive the same collets and arbors that are used in the main spindle. The front end of this spindle is also threaded, and this end of the spindle may be elevated to any desired degree between 10 degrees below the horizontal and 10 degrees beyond the perpendicular and rigidly clamped, if desired, at any point. The side of the spiral head is graduated in degrees to show the angle of the elevation of the spindle. The spiral head and foot-stock centers swing 10 inches in diameter and take 15 inches in length.

The foot-stock spindle may be raised vertically and set at an angle in a vertical plane. By this arrangement the spiral head and foot stock spindles may, in ordinary use, be kept in line when the front of the spiral head spindle has been elevated or depressed.

The net weight of the machine is about 1750 pounds and it occupies a floor space of 70 x 66 inches.

#### San Francisco News.

The past two weeks have been notable for the number of vessels that have come to hand laden with heavy consignments of iron in bar, bundle, sheet, wire, plate steel, rails, bar steel, pig iron, tin plate, &c. Conspicuous among the importations was the large quantity of tin plate carried on board the vessels from Europe. The "Ulrica" had 31,157 boxes, the "California" 35,739 boxes; a total of 66,926 boxes, worth nearly \$400,000 in this market. The imports this year have already been very heavy and the market is well supplied as far as we have gone. These importations come upon the market with a depressing effect, especially at present, when everything is so quiet and when the talk about the cutting down of the fruit pack to about 50 per cent. of what it was in 1892 is so generally prevalent. However, up to the present time the signs of cutting down are not as pronounced as they might be. The pack of cherries, for instance, is larger than it was in 1892, and it is too early as yet to judge of other packs. The pack of tomatoes will be about two-thirds of the normal. It is likely that but little more than half the packers will pack, because the banks refuse in many cases to extend the usual accommodation, but it is likely that there will be a much larger pack by those financially competent. There will probably be, therefore, a reduced pack, but not by so much as many now suppose. The pack of Alaska salmon will be lessened compared with that of 1892, and that on the Columbia River and in British Columbia will be less, but there will be,

after all, over 1,000,000 cases of salmon put up on the coast this year, and that will require a great deal of tin plate. The price at present is \$5.80 and \$5.85 for coke. As to pig iron there was a great deal imported for the first half of the year, doubtless in anticipation of the putting on of the new duty of 4 cents a pound. The imposition of the duty has not made any advance in the market, which is quotable at 22½ cents and is very dull.

As to pig iron, there has not been a very great deal to hand since our last, and the state of things may as well be described as quiet and unchanged.

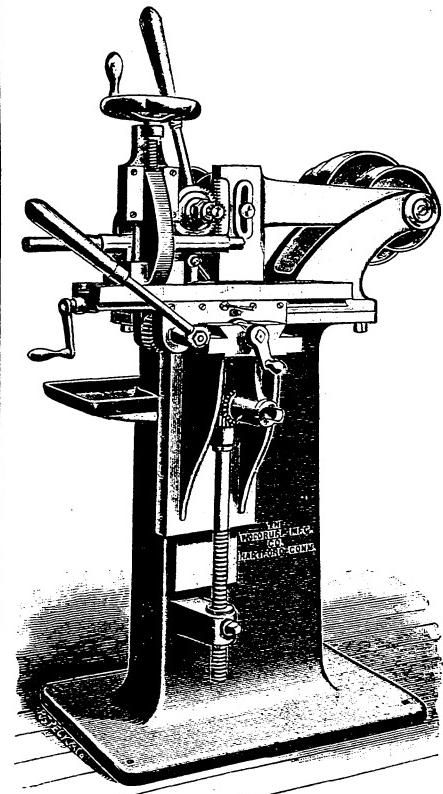
Nails continue very dull, with the market well stocked. The "Tam o' Shanter" brought 1065 kegs. The base price is \$1.85.

The general hardware and iron and steel trade has been pretty dull for some time, and especially during the past two weeks. Under ordinary circumstances this should be a good year, and the fall trade should be large. Our wheat crop will, it is generally believed, exceed that of 1892 in volume, while our fruit crop is very large and of especially good quality. Our crop of sugar beets, too, will be much larger than in 1892, our bean crop will be in excess, cereals generally will be more productive, and as a general thing there will be an increased product from forest, flood and field, but many circumstances conspire to render offset these favorable indications in greater or less degree. The financial strain is on and is likely for a while to remain so. The banks that closed in Southern California have been opening one by one, but the two San Francisco banks have not opened yet, although offers have been made by the MacDonalds to the effect that the president of the Pacific Bank, R. H. MacDonald, Sr., will put up \$100 in coin for every share of stock held by him or his sons on condition that the other stockholders do likewise, and offers as well to advance the \$100 at 6 per cent. to such stockholders as are not able to put up the money now, but nothing has come of it as yet. Meanwhile the other banks still continue to keep on the brakes in the matter of money lending and this keeps everything back. It has interfered with the packing and drying of fruit and lowered its price. While this is the case the price of wheat is lower than it has ever before been in this city. The country is as a consequence buying very little.

dent Charles E. Pugh, who gave the scheme his personal attention, even to the making of the contracts with the telephone companies.

#### Hand and Key-Seat Milling Machine.

The hand and key-seat milling machine, made by the Woodruff, Mfg. Company of Hartford, Conn., is especially adapted for use in connection with the Woodruff system of keying, although it is well arranged for general work. The spindle head is counterbalanced and has a vertical lever feed, making it possible to take light and sensitive cuts on heavy work without the usual danger of breaking the cutters. The spindle head can also be locked at any point of its stroke and made rigid with the frame. The table



Hand and Key-Seat Milling Machine.

has both rack and screw feed, the change from one to the other being made instantly by tightening or loosening a screw. With the convenient upright vise furnished with the machine it is practically, with the exception of spiral milling, a universal machine. The vertical movement of the knee is 9 inches, movement of the slide by the rack 4½ inches and by the screw 10 inches; the cross movement of the slide by the screw is 3½ inches and the vertical movement of the spindle is 3½ inches.

The first gun of modern ordnance for the protection of New York is now in position at Sandy Hook. It is a 12-inch gun, weighing 51½ tons, and is mounted on a Snyder disappearing carriage. It is the first 12-inch gun built in this country. It was constructed at the Watervliet Arsenal, and has fully borne out all the expectations of its designers.

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## THE WEEK.

Grasshoppers and crickets have made their appearance in such unprecedented numbers in Idaho as to seriously threaten the existence of the crops. Like the Egyptian locust they devour every green thing in their line of march.

Indianapolis, Ind., has adopted the plan of cremating her city garbage.

A combined electric and inclined railway is nearing completion at Pasadena, Cal., which is to connect Pasadena and Los Angeles with the highest peak of the Sierra Madre range in that vicinity.

The adoption of rubber tires for road vehicles is being strongly urged in various quarters and the idea appears to be favorably received. A company in New York, who have started the manufacture of these wheels, report that they are overwhelmed with orders. Rubber-tired wheels have long been in use in European cities. They serve the double purpose of saving the conveyance from shocks and jars and of being practically noiseless in operation.

Montreal, Canada, is suffering from a blockade of hay, which is being sent down for shipment to England in greater quantities than can be conveniently handled at the wharves.

The Rapid Transit Commissioners in New York City have consented to grant the officers of the Manhattan Elevated Railroad until August 17 to decide whether they will accept the terms proffered to them in regard to immediate extension of facilities and increase of those upon existing lines. It is understood that the Manhattan corporation is unwilling to embark upon further large expenditures during the present financial stringency.

One day's cattle shipments through Denison, Texas, recently, over the Missouri, Kansas & Texas road, amounted to 368 carloads.

What is said to be the largest alternating current electric motor ever set up is being tested at the works of the Hartford Electric Light Company, at Hartford, Conn. It has 300 horsepower, and requires 3000 volts, reduced by transformers to 600 volts.

A glut of the worst kind obtains in the provision markets of the principal European countries, so far as American shipments are concerned. These are stated to have been unprecedented in volume to England, France and Germany during the past few weeks; and as hay and feed are so dear on the other side the imported cattle have been sold for anything they would fetch.

The following statement of the several amounts of gold and silver carried by the leading countries of the world has been published in a report of the Director of the United States Mint:

Great Britain, gold.....	\$550,000,000
Great Britain, silver.....	100,000,000
France, gold.....	800,000,000
France, silver.....	700,000,000
Germany, gold.....	600,000,000
Germany, silver.....	210,000,000
Russia, gold.....	190,000,000
Russia, silver.....	60,000,000
United States, gold.....	654,000,000
United States, silver.....	575,000,000
Canada, gold.....	16,000,000
Canada, silver.....	5,000,000
India, silver only.....	900,000,000
China, silver only.....	700,000,000

The "Paris" broke the westward record from Southampton on her voyage

last week. The time of the American liner was 6 days, 9 hours and 37 minutes.

Tea-growing as an industry has not been successful in South Carolina. Local conditions do not appear favorable to the cultivation of the plant. California may give a better showing.

Agitation goes on in some quarters with the object of continuing the World's Fair for another year.

The Navy Department has formally accepted the cruiser "Detroit," built by the Columbian Iron Works of Baltimore, and has authorized the payment to the builders of reserved funds amounting to about \$225,000.

The possibilities of wealth in the utilization of waste was never more strongly exemplified than in the case of cotton seed. Thirty years ago it was thrown away or used as a fertilizer. Today an industry is based on the material of which the products are worth \$27,000,000 a year and which is rapidly increasing. Cotton-seed oil and oil cake are recognized and valued commercial products.

A St. Louis journal figures out the world's wheat crop to be 100,000,000 bushels short of that of 1892.

Crops in the South are reported to be in fine condition, and the yield promises to be greater than that of last year. In 1892 the product was as follows:

Cotton.....	\$932,000,178
Cereals.....	386,864,500
Tobacco.....	37,314,550
Sugar and molasses.....	29,898,650
Rice.....	10,212,462
Potatoes.....	17,420,800
Hay.....	23,647,500
Fruit.....	25,000,000
Other farm products.....	238,460,500
Total.....	\$1,095,869,140

Owing to change of printers, two issues of the *Patent Office Gazette* have failed to appear.

Sixty-seven new cannery factories were established in the South during the first half of this year.

In Barbadoes the sugar crop is reported to have suffered greatly from the drought, and the yield will probably be considerably below the average.

Canada rejoices in the promise of an excellent harvest, both in cereals and fruits, while the hay crop is larger than for some years. The value of the hay crop is enhanced by its failure in Europe and the consequent demand for foreign fodder.

The London *Financial News* believes that the Government of India will not be buyers of silver for another 12 months, the reserve now in hand being sufficient for circulation purposes for a year or more.

There are 1850 cities and towns in the United States which are equipped with electric light.

The report of the treasurer of the Calumet & Hecla Mining Company's Aid Fund, for the year ending May 1, 1893, has just been issued. It shows the amount of collections for the year to be \$20,314.75; amount donated by the company to be \$20,314.75; total, \$40,629.50. Dividends and interest, \$8325.55; unclaimed orders, &c., \$90.32; total receipts for the year, \$49,045.37; balance May 1, 1892, \$23,161.66—\$72,207.03. Payments, orders as per list, \$31,783.82; 116 shares stock C. & H. Mining Company, \$32,653; printing

not paid by order, \$6.25; cash on hand, \$7763.96—\$72,207.03. Summary of payments: Paid for sickness, \$21,424.70; for accidents (three fatal) \$1500; accidents, \$8358.90; partial disability, \$200; other amounts, \$800.22. Statement of funds: Cash, \$7763.96; 388 shares stock C. & H. Mining Company cost \$91,459.32—\$99,223.28.

The general report on the foreign commerce of the United States was published last week. The following table shows comparison of the official figures on merchandise traffic with those of last year and for the two preceding months:

	Exports.	Imports.
June.....	1893 \$65,412,367	1892 \$64,888,837
May.....	68,742,612	69,703,479
April.....	59,874,237	75,954,962

A Chicago dispatch reports that lake business showed a material improvement on all the principal lines of traffic, and the feeling in marine circles was that business was destined to steadily improve. It was thought that the bottom had been reached, and that there would now be a slightly better figure paid for water transportation, although no one was hopeful that the big promise of a highly profitable season of last spring was to be fulfilled. A Buffalo dispatch states that coal has begun to be shipped again, and that a part of the vessels tied up there waiting for cargoes have secured loads and are moving again. At Duluth, where the Buffalo wheat rate brought the unprecedented figure of 1 cent a bushel to Buffalo, there was an advance to 1½ cents.

According to the report of the Secretary of the Treasury the export of corn and wheat from the principal shipping ports was as follows for the year ending June 30:

Corn.	Bushels.
New York.....	12,296,243
Boston.....	3,596,836
Philadelphia.....	4,252,443
Baltimore.....	6,524,162
New Orleans.....	4,265,749

Wheat.	Bushels.
New York.....	39,519,574
Boston.....	3,806,878
Philadelphia.....	9,424,410
Baltimore.....	14,218,961
New Orleans.....	14,290,360

Efforts are being made by the Department of Agriculture to introduce the cultivation of camphor into the United States. The tree from which it is obtained is indigenous to Japan, and its wood is very valuable for cabinet work. It also yields, in addition to the camphor gum, an oil which is useful for illumination. Our Consul at Osaka strongly recommends that competent persons be sent to the camphor-producing districts to study the trees and the details of camphor manufacture.

The New York *Press* asserts that \$345,000,000 of American capital has been invested in business enterprises in Mexico during the past three years.

Hon. Patrick Walsh of the *Augusta Chronicle* says that three things are necessary to make the South prosperous and independent—namely, diversified agriculture, the pursuit of mining, and the development of manufactures.

# The Iron Age

New York, Thursday, July 27, 1893.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## Cheapness of Credit.

With the recurrence of hard times and the multiplication of failures on every hand, a great deal is heard of the good effects that will be accomplished through the permanent retirement of those who have been trying to do business on too little capital. This is a theme which is dwelt on in every circle, and the small merchant, whose utmost credit is measured by hundreds, applies the criticism as glibly to his weak competitors as does the millionaire operator to his weaker rivals. It is recognized that every line of trade has in it a number of weak concerns that even in good times are tottering on the verge of bankruptcy, because of too great an extension for the capital invested. And men argue that if only these lame ducks could be driven out of business everybody else would have a much better opportunity. Prices would be more stable, because there would be no one making occasional forced sales to raise money or offering inducements of an exceptional character to increase trade.

Proceeding upon this line of argument, men are apt to draw distinctions and term some business houses illegitimate or irregular. They are thus characterized solely because they do not have sufficient capital to conduct their operations in the conservative, staid, dignified manner peculiar to concerns with unlimited bank accounts or unlimited credit. They are obliged to make a raid on the market when a little pinch comes, and cut prices so as to make a line of goods move quickly and bring in the requisite cash. They are apt to break out most unexpectedly and of course always most disadvantageously for their competitors who would encourage stability and deplore distressing fluctuations. The iron and hardware trades do not suffer much from "fire sales" and from "misfits," it is true, but there are equally annoying circumstances to vex the sturdy merchant who discounts his bills and expects all his customers to do the same.

Credit has perhaps been too cheap in the recent past. The point had almost been reached when a man could go into business with no capital whatever and obtain credit at a dozen different sources of supply. He could certainly command a credit of several times his cash resources. Every creditor knew that he was buying from others at the same time greatly in excess of his capital, and yet there was no protest at

the great expansion in business thus promoted. Orders had to be obtained, because small margins made it necessary to do a large business, and the dance went on. Sometimes the banks were imposed upon by this class of people representing themselves to be exclusive customers, slipping in back doors, because they did not want it known that they were borrowers of money, yet using every bank in their vicinity in the same way until the bubble grew too big and finally burst. These are the people that straightforward business men would be glad to see permanently retired. Many of them have been relegated to the commercial graveyard already, and others will follow as the monetary pinch retains its hold. Unfortunately, these people do not go alone, but take company with them worthy of a better fate.

Out of these tight times we will emerge presently on a much better basis. Business will be done more largely for cash. Credits will be very carefully scrutinized. It will not be an easy matter for a merchant to buy goods to the full amount of his capital from a dozen different houses and trust to good luck to pull through. That time will come only after the country has enjoyed a long season of prosperity again and forgotten all about the panic of '93. Meantime energetic men of small means will find it much harder to get a start in the world than from '80 to '90. It will not do to refuse credit to all of them, establishing a cast-iron rule on the subject, as that would kill all enterprise and prevent perhaps most capable business men from getting a good foothold in the great struggle for supremacy.

## Can Prices Go Lower?

There is some encouragement in the fact that the present severe financial stringency has found the iron and steel trades with prices at bottom. The depression did not come at a time when values were inflated, and has, therefore, had relatively little effect upon them. How different the influence of the present condition of affairs would have been if we had been running along with prices at a normal level may be easily imagined. The slump would have come suddenly and would have brought with it disaster to dozens, where now single concerns have been forced to the wall. However much opinions may differ concerning the immediate future, it is certain that the day is not far off when the expediency of buying in order to take advantage of low prices will come up for consideration with every financially strong concern. Even though, for other reasons, that time may not have arrived as yet, it is wise to study the situation with reference to the first question which arises—Can prices go any lower?

One matter deserves to be examined at the outset, and that is the manner in which current prices are made. It is well known that the principal factors

in establishing values during the past three months have been either the necessity of selling in order to keep afloat, or the desire to market stocks of raw material too expensive to carry, or, finally, the anxiety to have the men fairly busy, hold trade and keep the organization together.

On the whole, the number of works which must sell at any sacrifice in order to escape a receivership is relatively small. But they make the market, and are aided by the firms who want to realize on stocks of raw material or finished goods because it is too expensive a load to carry with good paper selling with difficulty at 10 to 15 per cent. It will be readily understood that cost of production does not enter into consideration under such circumstances. Of course, what is one producer's cost may leave a very snug profit to a better situated competitor, so that it does not follow that because some are losing money rapidly, the great majority are also impairing their capital by selling goods at less than they can make them for. During a long period of depression buyers grow very callous to such pleading, and the argument that prices are below cost has been worn pretty threadbare by this time, because it was liberally advanced before the facts justified its use. Many sellers have shouted wolf so long that the cry has ceased to attract any notice.

There has not been a time during the past three months, when, in the leading lines in the iron and steel trade, some one great plant has not been at the end of its orders, and has gone into the market with the determination to capture work. We doubt whether there are many plants of consequence which have not made cost price the limit to their salesmen, with orders to go down to it if necessary. The practice has been so general that it is safe to say that values have been at bottom, as measured by the capacity of the leading concerns in the country.

But, it may be argued, since then raw materials, and in many cases wages, too, have gone down. The very facts which are cited as proving that recent prices have been down to bedrock encourage the belief that the economies effected will find their expression in a further lowering of the market. The limit is reduced, prices will follow.

But the fact is forgotten that the pace has already been so hot that many have fallen by the wayside; that a manufacturer does not load up to full capacity with unremunerative work, and that the restriction of the supply at a price is quite another matter than stopping altogether. When a mill is running single turn, a manufacturer can hold all the trade he cares to keep, in times like these. He can keep that part of his working force which he would be sorry to part with, and weed out the troublesome and inefficient element. He gets into a snug position financially and otherwise, from which business which does not pay will

not readily tempt him. Every fractional decline, every day of continued low prices makes its inroad into the stock of hope which has kept many makers in the ranks of producers.

Ore is down to its lowest possible notch. Coke has settled down very heavily of late. Soft steel, as soon as business begins again in earnest, will probably sell at figures close to the record. Plates, structural iron, bars and shapes are selling at extremely low prices, the only article which nominally is selling at a remunerative rate, if there were any business, being steel rails. The reduction in labor in the West may be regarded as an equalizing. It will simply mean that Western works will penetrate a little further away from home, while plants in other sections will correspondingly lessen their sales and their output. Those who figure on any material reduction in the prices of iron and steel in the near future will probably reckon without their host.

#### PERSONAL.

Fred J. Manley has been appointed Steam Boiler Inspector for Allegheny County. This includes Pittsburgh, Allegheny and surrounding territory.

Julian Kennedy, the well-known mechanical engineer of Pittsburgh, has been chosen to prepare plans and superintend the construction of the new water works to be built in Allegheny, Pa. It will be remembered that the water plant for the Homestead Steel Works, at Homestead, Pa., was erected under the supervision of Mr. Kennedy.

Edmund Yates, the London correspondent of the New York *Tribune*, reports that A. J. Moxham has subscribed £5000 as a first installment to a fund of £20,000 for the ground-rent campaign in England.

R. A. Hadfield of Sheffield, of manganese steel fame, is expected to arrive this week on the "Campania."

A new apparatus termed the telephoto and intended for signaling at sea by night has been brought out by an engineer resident at Vienna. There is an aluminum mast from 10 to 30 feet high, a battery or dynamo, a cable of electric wire, and a transmitter key board of thirty-seven keys. On the mast are arranged 106 incandescent lamps, which can be manipulated to form the signs of the Morse alphabet. Seventy-two letters a minute, it is stated, can be shown on the telephoto, clearly visible three miles in daylight and ten miles at night.

At the Watervliet, N. Y., arsenal the 10-inch Woodbridge wire-wound gun, which has been in construction for about six years, has been completed, and is being shipped with three other 10-inch guns to the testing grounds at Sandy Hook. Work was commenced on the gun at the Watertown, N. Y., arsenal, and it was afterward brought to Watervliet, where there are better facilities for the work. This is the first steel wire-wound gun ever built at the works, and much is expected of it. The gun is about 29 feet long, and throws a projectile weighing 600 pounds 10 miles. Six 8-inch guns will be shipped

to Sandy Hook during the next two weeks, and in August three of 10-inch caliber will be finished.

#### OBITUARY.

##### JOHN ROLLINS SMITH.

John Rollins Smith, treasurer and proprietor of the Springfield Iron Works, Springfield, Mass., is dead. He was born in Hardwick, Mass., in 1839, his father being Moses Smith, a prosperous farmer of Puritan ancestry. Educated in the district schools, in the intervals between the necessary times of farm labor, his mind took an early bent toward a profession, and as soon as able he entered the Polytechnic Institute at Worcester and took a course of civil engineering. His theoretical knowledge gained at the institute was rounded out by practical experience in the office of eminent engineers in that city. He came to Springfield in 1862 and opened an office, meeting with gratifying success. Later he was associated with the late ex-Mayor A. D. Briggs in the iron and bridge business, the firm succeeding that of Harris & Briggs, and about six years ago he opened the Springfield Iron Works, making a specialty of architectural iron and bridge work.

Mr. Smith was a public spirited citizen, and was at one time president of the Common Council of Springfield. He was the founder of the manual training school at Springfield.

##### PROFESSOR WERNER KUMMEL.

Werner Kummel, one of the best known engineers in Germany, died at the Oak-land Hotel, Chicago, on the 19th inst., aged about sixty-nine years. Mr. Kummel had been in America about three weeks and in Chicago about one week. He came here to visit the World's Fair and deliver two lectures before the congress of engineers. During the very warm weather after his arrival in Chicago, he was overcome by the heat, and died after a few days illness.

Mr. Kummel was the leading engineer on the water works in Germany. The water works in the city where he lived, Altona, which has 150,000 inhabitants, were built under his direction, and his friends say that during the epidemic of cholera in Hamburg, only a few miles from Altona, last year, not a case appeared in the latter city except a few imported from Hamburg. Mr. Kummel was an intimate friend of Professor Koch, the eminent specialist. Since he had been in America he had been in Boston, New York and Philadelphia, where he was consulted by a number of American engineers interested in water and gas engineering. He had prepared two papers which he was to have read before the engineers' congress in connection with the World's Congress Auxiliary.

The general committee of the Associated Engineering Societies of the United States and Canada requested, as a mark of respect, the attendance of American engineers, resident in Chicago, at the funeral. The remains were interred in Oakland Cemetery in that city on the 21st.

The members of the New Orleans branch of the Brotherhood of Boiler makers have demanded a nine-hour day with ten hours' pay. Encouraged by the success of the demand in Boston and Chicago, the international body has decided to make a similar demand throughout the United States, Canada and Mexico.

#### CORRESPONDENCE.

##### The Old Bessemer Converter.

*To the Editor:*—On June 8, in *The Iron Age*, you give a sketch of an old Bessemer converter used at Cambria Iron Works in 1861 and 1862. I think there must be some mistake about this converter and the dates, since the converter is in appearance like the one bought from Henry Bessemer, Carlisle street, Sheffield, by Mr. Holley at the end of 1862 or beginning of 1863. Mr. Holley distinctly told me that no Bessemer steel was made in the United States at that time and pressed me to come out with him. At that time there were only three Bessemer steel works in England and one in Sweden which was using the Clapp & Griffiths shaped vessels. When the Swedish firm of Goransson & Co., Sandviken, used the present shaped converter I was there to make the first heat of steel and take it direct from the blast furnace. This was in 1864.

JOHN FACER.

##### Failure of C. W. Depauw.

On the 22d inst. Charles W. Depauw and the New Albany Rail Mill Company of New Albany, Ind., made an assignment for the benefit of their creditors. The cause leading to the failure was the assignment of the Premier Steel Works in Indianapolis several months ago, of which Charles W. Depauw held 6450 shares.

About 3 o'clock of the same day another deed of assignment was filed—that of the New Albany Rail Mill Company. The officers of the mill are Charles W. Depauw, president; N. T. Depauw, vice-president, and Albin Trinsler, manager. The Union Trust Company of Indianapolis is made assignee in each deed. The last deed also conveys to the trust company all personal property, goods, merchandise, chattels, property rights and credits. The assets are valued at over \$1,000,000, and the liabilities are not stated. A few minutes after the deed had been filed Mr. Depauw said:

"I can say but little regarding the assignment. It is a personal one, and does not in any way affect the interests of my brother, N. T. Depauw. The failure was caused by the contingent liabilities on paper of the Premier Steel Works in Indianapolis, and the rail mill company in this city and the financial stringency now prevailing throughout the country."

Mr. Depauw's individual assignment is a sweeping one, and the man who was worth \$1,000,000 three months ago is now practically penniless. The debts for which Mr. Depauw became liable for the New Albany Rail Mills and the Premier Steel Works amount to about \$300,000. Of these over \$500,000 worth are indorsements for the Premier Steel Works and the remainder for the New Albany Rail Mill. The value of these two plants and stocks on hand in ordinary times might be placed at \$2,000,000.

Contracts have been awarded for constructing the big lock on the Colbert Shoals Canal on the Tennessee River, near Florence. It will cost \$345,000. The canal will be 8 miles long and 150 feet wide, and will afford navigation up the Tennessee River to Chattanooga. The canal will cost in all about \$3,000,000, and it is said that the money is all available.

## The Western Wages Scale.

At Pittsburgh the situation as regards the settlement of the iron scale shows no change over that noted last week. Perhaps the most significant feature of the week was the fact that at the works of Jones & Laughlins, Limited, where there was a lodge of the National Union of Finishers, consisting of some 96 members, the firm resumed operations without going through the formality of signing the scale of the new organization, and all employees formerly members of the Amalgamated Association, but who deserted that body and joined the ranks of the National Union of Finishers, were compelled to resume work under the rates contained in the scale of the Amalgamated Association or forfeit their positions. The action of the firm in refusing to treat with the new organization has undoubtedly crippled it, and there are many who believe that it will exist but a short time. It is evident that it is destined to play a very small part in the negotiations with the manufacturers during this year, at least.

As yet there has been no move on the part of any additional manufacturers at Pittsburgh to sign the Amalgamated Association iron scale, nor is there any disposition being shown so far to start up with non-union men. What will be done in this direction in the future cannot now be stated, but it is possible the idleness of the mills may be prolonged for some time. In the Mahoning Valley the mills are all closed with the exception of two, and as yet there is no disposition being shown to hurry repairs in order to get started again. Since our issue of last week the following-named concerns have signed the Amalgamated iron scale with the proviso that they will be allowed any reductions that may be made when it is finally adopted:

Muncie Nail Company, Muncie, Ind.  
Tudor Iron Works, St. Louis, Mo.  
(Works at East St. Louis, Ill.)  
Summers Brothers & Co., Struthers,  
Ohio.

Akron Iron Company, Akron, Ohio.  
The American Tin Plate Company,  
Elwood, Ind.

The following are the principal features of the scale signed by Jones & Laughlins and presented by the Amalgamated Association to the other union mills.

The only change in the introduction is in the fifth paragraph, which reads as follows, the new matter being bracketed:

5. That mills may work three turns in 24 hours when practicable (excepting boiling department).

**Boiling**—The rate has been reduced from \$5.50 on a 2 cent card to \$5, the reduction of 50 cents per ton being on the whole scale throughout. Up to 2.6 cent card, the scale advances 10 cents for each 1-10 cent in the advance in price.

The only changes in the notes are:

7. For cast-iron swarth, worked on cinder bottom, the price per ton shall be 50 cents less than straight price paid for boiling. (This is a reduction of 50 cents.)

8. For half wrought-iron turnings and half cast-iron swarth, worked on cinder bottom, the price to be \$4.50 per ton. (Formerly 85 per cent. of straight price for boiling.)

9. For wrought-iron turnings, worked on cinder bottom, \$8.25 per ton; the price for working turnings to advance

and decline in the same proportion as the boilers' scale. (Formerly \$3.50.)

There is no change in the scales in the muck or puddle mill, on scraping and busheling, on knobbling, on heating, slabs and shingling, or on the bar and nail plate mills. To the latter scale the following has been added:

7. On bar and 12-inch mills working skelp exclusively on 2-cent Western Iron Association card, the heater shall receive bar mill prices. The price for rolling shall be  $39\frac{7}{16}$  cents.

Catching, five eighths of bar mill rolling price.

Rough-down shall receive  $18\frac{9}{16}$  cents per ton, paid by company.

These prices to advance and decline in the same ratio as bar mill scale.

The scale on the guide and 10-inch mills is unchanged, the rates remaining the same for nut iron, channel iron, T-iron, angles, clip and wagon strip and hame iron.

The following is the new hoop and cotton-tie scale. Down to  $1\frac{1}{4}$  milk-can hoops the figures are the same, as is also  $1\frac{1}{4}$  ratchet iron, clips, slats, finger and cotton tie. The figures below the latter are new. The reduction is 5 per cent. from 2 inches down to  $\frac{1}{2}$  inch wide to No. 20:

The scale on plate and tank mills remains at 60 cents for rolling and 72 cents per ton for heating, but there has been added to the foot notes the following very important proviso, since it is stated that there is not a single mill in the country working under the scale, outside of Jones & Laughlins which can run up the tonnage until the special scale applies.

9. Plate mills with average production of 30 tons or over 10 per cent. off above prices for rolling and heating on common sizes, but all extras to remain as in foot notes, no percentage off.

The scale on rolling pipe iron on sheet and jobbing mills remains unchanged at \$3.06 on a 2-cent card.

The sheet mill scale remains as follows:

It is agreed that a 2 cent Western Iron Association's card, the prices for rolling on a sheet and jobbing mill shall be as follows, with 2 per cent. additional for each one-tenth advance of said card, and 2 per cent. decline for each deduction of one tenth from said card.

	Price for rolling on a 2-cent card, per ton, 2.240 pounds.
Gauges.	
No. 8 and heavier.....	\$3.60
Nos. 9 to 11.....	4.00
Nos. 12 to 14.....	4.80

### Hoop and Cotton Tie Mills.

Sizes.	Roller.	Heater.	Rougher.	Catcher.
$2\frac{1}{2}$ and upwards to No. 15.....	\$1.45	\$0.72 $\frac{1}{2}$	\$0.36 $\frac{1}{4}$	\$0.36 $\frac{1}{4}$
Lighter than No. 15.....	1.67 $\frac{1}{2}$	.83 $\frac{1}{4}$	.41 $\frac{1}{8}$	.41 $\frac{1}{8}$
$1\frac{3}{4}$ milk can hoops.....	2.05	1.02 $\frac{1}{2}$	.51 $\frac{1}{4}$	.51 $\frac{1}{4}$
$1\frac{3}{4}$ x No. 10, 11 and 12.....	1.50	.75	.37 $\frac{1}{2}$	.37 $\frac{1}{2}$
$1\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{1}{2}$ to 12 inclusive.....	1.57 $\frac{1}{2}$	.78 $\frac{1}{4}$	.39 $\frac{1}{2}$	.39 $\frac{1}{2}$
$1\frac{1}{2}$ ratchet iron.....	1.90	.95	.42 $\frac{1}{2}$	.42 $\frac{1}{2}$
$1\frac{1}{2}$ and $1\frac{3}{8}$ , 10, 11, 12.....	1.89 $\frac{1}{2}$	.94 $\frac{1}{4}$	.47 $\frac{1}{2}$	.47 $\frac{1}{2}$
$1\frac{1}{2}$ x $\frac{1}{2}$ to 12, inclusive.....	2.33 $\frac{1}{2}$	1.19 $\frac{1}{4}$	.59 $\frac{1}{2}$	.59 $\frac{1}{2}$
$\frac{3}{8}$ x $\frac{1}{2}$ to 12, inclusive.....	2.65 $\frac{1}{2}$	1.32 $\frac{1}{4}$	.66 $\frac{1}{2}$	.66 $\frac{1}{2}$
$\frac{3}{8}$ x $\frac{1}{2}$ to 12, inclusive.....	3.46 $\frac{1}{2}$	1.73 $\frac{1}{4}$	.86 $\frac{1}{2}$	.86 $\frac{1}{2}$
$\frac{1}{2}$ x $\frac{1}{2}$ to 12, inclusive.....	4.27 $\frac{1}{2}$	1.13 $\frac{1}{4}$	1.06 $\frac{1}{2}$	1.06 $\frac{1}{2}$
$1\frac{1}{16}$ x $\frac{1}{2}$ to 12, inclusive.....	3.06	1.53	.76 $\frac{1}{2}$	.76 $\frac{1}{2}$
$1\frac{1}{16}$ x $\frac{1}{2}$ to 12, inclusive.....	3.87	1.93 $\frac{1}{4}$	.96 $\frac{1}{2}$	.96 $\frac{1}{2}$
$\frac{1}{16}$ x $\frac{1}{2}$ to 12, inclusive.....	4.81 $\frac{1}{2}$	2.40 $\frac{1}{4}$	1.20 $\frac{1}{2}$	1.20 $\frac{1}{2}$
$\frac{1}{16}$ x $\frac{1}{2}$ to 12, inclusive.....	5.62 $\frac{1}{2}$	2.81 $\frac{1}{4}$	1.40 $\frac{1}{2}$	1.40 $\frac{1}{2}$
Clips.....	1.75	.87 $\frac{1}{2}$	.43 $\frac{1}{2}$	.43 $\frac{1}{2}$
Slats.....	2.05	1.02 $\frac{1}{2}$	.51 $\frac{1}{4}$	.51 $\frac{1}{4}$
Finger.....	1.75	.87 $\frac{1}{2}$	.43 $\frac{1}{2}$	.43 $\frac{1}{2}$
Cotton tie.....	2.05	1.02 $\frac{1}{2}$	.51 $\frac{1}{4}$	.51 $\frac{1}{4}$
$1\frac{1}{4}$ and upwards to No. 13.....	1.67 $\frac{1}{2}$	.83 $\frac{1}{4}$	.41 $\frac{1}{8}$	.41 $\frac{1}{8}$
$1\frac{1}{4}$ and $1\frac{3}{8}$ x 13.....	1.75	.87 $\frac{1}{2}$	.43 $\frac{1}{2}$	.43 $\frac{1}{2}$
$1\frac{1}{4}$ and $1\frac{3}{8}$ x 13.....	2.05	1.02 $\frac{1}{2}$	.51 $\frac{1}{4}$	.51 $\frac{1}{4}$
$1\frac{1}{4}$ x $\frac{1}{2}$ x 13.....	2.65	1.32 $\frac{1}{2}$	.66 $\frac{1}{2}$	.66 $\frac{1}{2}$
$\frac{3}{8}$ x 13.....	2.95	1.47 $\frac{1}{2}$	.73 $\frac{1}{2}$	.73 $\frac{1}{2}$
$\frac{3}{8}$ x 13.....	3.83	1.92 $\frac{1}{2}$	.96 $\frac{1}{2}$	.96 $\frac{1}{2}$
$\frac{3}{8}$ x 13.....	4.75	2.37 $\frac{1}{2}$	1.18 $\frac{1}{2}$	1.18 $\frac{1}{2}$
$1\frac{1}{16}$ x 13.....	3.40	1.70	.85	.85
$1\frac{1}{16}$ x 13.....	4.30	2.15	1.07 $\frac{1}{2}$	1.07 $\frac{1}{2}$
$\frac{1}{16}$ x 13.....	5.35	2.67 $\frac{1}{2}$	1.38 $\frac{1}{2}$	1.38 $\frac{1}{2}$
$\frac{1}{16}$ x 13.....	6.25	3.12 $\frac{1}{2}$	1.56 $\frac{1}{2}$	1.56 $\frac{1}{2}$
$\frac{1}{8}$ , lighter than $1\frac{1}{16}$ .....	9.00	4.50	2.25	2.25

The following is new:

### Ten-Inch and Smaller Mills Working $2\frac{1}{8}$ -Inch and Narrower No. 10 and Lighter Hoop Exclusively.

Sizes.	Roller.	Heater.	Rougher.	Catcher.
$1\frac{1}{4}$ and up, No. 13 to 20, inclusive.....	\$1.59 $\frac{1}{2}$	\$0.78 $\frac{1}{2}$	\$0.39 $\frac{1}{2}$	\$0.39 $\frac{1}{2}$
$1\frac{1}{4}$ and $1\frac{3}{8}$ , No. 13 to 20, inclusive.....	1.66 $\frac{1}{2}$	.88 $\frac{1}{2}$	.41 $\frac{1}{8}$	.41 $\frac{1}{8}$
$1\frac{1}{4}$ and $1\frac{3}{8}$ x 13 to 20, inclusive.....	1.94 $\frac{1}{2}$	.97 $\frac{1}{2}$	.48 $\frac{1}{16}$	.48 $\frac{1}{16}$
$1\frac{1}{4}$ x 13 to 20, inclusive.....	2.51 $\frac{1}{2}$	1.25 $\frac{1}{2}$	.62 $\frac{1}{16}$	.62 $\frac{1}{16}$
$\frac{3}{8}$ x 13 to 20, inclusive.....	2.80 $\frac{1}{2}$	1.40 $\frac{1}{2}$	.70 $\frac{1}{16}$	.70 $\frac{1}{16}$
$\frac{3}{8}$ x 13 to 20, inclusive.....	3.65 $\frac{1}{2}$	1.82 $\frac{1}{2}$	.91 $\frac{1}{16}$	.91 $\frac{1}{16}$
$\frac{3}{8}$ x 13 to 20, inclusive.....	4.51 $\frac{1}{2}$	2.25 $\frac{1}{2}$	1.12 $\frac{1}{16}$	1.12 $\frac{1}{16}$
$1\frac{1}{16}$ x 13 to 20, inclusive.....	3.23	1.61 $\frac{1}{2}$	.80 $\frac{1}{2}$	.80 $\frac{1}{2}$
$1\frac{1}{16}$ x 13 to 20, inclusive.....	4.08 $\frac{1}{2}$	2.04 $\frac{1}{2}$	1.02 $\frac{1}{8}$	1.02 $\frac{1}{8}$
$\frac{1}{16}$ x 13 to 20, inclusive.....	5.08 $\frac{1}{2}$	2.54 $\frac{1}{2}$	1.27 $\frac{1}{16}$	1.27 $\frac{1}{16}$
$\frac{1}{2}$ x 13 to 20, inclusive.....	5.93 $\frac{1}{2}$	2.96 $\frac{1}{2}$	1.48 $\frac{1}{16}$	1.48 $\frac{1}{16}$

There are no changes in the notes.

Nos. 15 to 17.....	5.55
Nos. 18 to 21.....	6.75
Nos. 22 to 24.....	8.00
Nos. 25 and 26.....	9.20
No. 27.....	10.00
No. 28.....	10.65
No. 29.....	11.15
No. 30.....	12.00
No. 8 and heavier.....	3.00
No. 9 and 10.....	3.50
No. 11.....	4.00

The United States standard weight of gauges has been adopted.

The extras remain the same, the following paragraph being added:

19. Where improved squaring shears are used the company shall pay for the grinding of the knives; this to apply to squaring shears only.

In the sheet mill hands' scale the following two paragraphs have been dropped:

9. Sheet mills working iron or steel 120 inches long and over, the day hands shall be paid an average day's work for the same.

10. Mills working narrow widths and short lengths, below and including 28 inches wide and 84 inches long, shall be allowed to make nine heats for a turn's work, and for each turn of nine heats the day hands shall be paid in proportion. This clause shall only apply to mills that make a uniformly large amount of narrow width and short length sheets.

The latter paragraphs have been dropped from the roughing and catching scale on sheet and jobbing mills, which otherwise remains the same.

There is no change in the tin and black plate mill scale, or in the scale for rolling muck bar and finished iron for sheet iron.

The scale for the structural mills has been unchanged, but the following very significant paragraph has been added to it:

2. On 22-inch structural mills averaging 50 tons or over per turn, and on 18 inch structural mills averaging 40 tons or more per turn, special scales have been arranged.

In the scale on large and on small universal plate mills the roller is cut from 47½ to 42½ cents.

No modification has been made in the scale for continuous trains, and the rates for wire rod rolling remain the same.

It will be observed that the only concession made by the Amalgamated Association is on boiling, on hoop and cotton-tie mills and on rolling plates and structural iron to certain mills possessing exceptional capacity.

Bids were opened last week by the Chicago Commissioner of Public Works for the pipe for extensions of the water system to the district about Roseland and about Humboldt Park, the residents of which have been needing water for years. But three bids were received, and but one of these was for the whole amount of pipe needed. This bid is a joint one submitted by Dennis Long & Co. of Louisville, Ky., the Addyston Pipe & Steel Company of Cincinnati, and the Howard-Harrison Iron Company of St. Louis and Birmingham, Ala. The figure given is \$25.90 a ton for pipe delivered on the ground where needed. The Buffalo Cast Iron Pipe Company bid \$26.40 for furnishing a part of the pipe needed and the Lake Shore Foundry \$26.50 on the same conditions. The estimated cost of all the pipe needed is \$300,000.

It is stated that four furnaces of the Edgar Thomson plant are to be blown out this week.

#### Canadian Notes.

The town of Peterborough is becoming alive to the importance of prompt action if it is to be in the race with other towns and cities that are contemplating the establishment of iron furnaces. Peterborough is in the heart of one of Ontario's most promising sources of ore supply. The ore in the Belmont mine is a high grade Bessemer, low in phosphorus and sulphur. Near it are the Blairton and Snowdon mines with their stores of magnetic ores. Farther east and north are the hematite ores of the Coe Hill region. One of the mines of this latter district is being opened now, and a good deal of attention is being devoted to North Hastings mining lands generally in view of the possibility of the United States duty being removed. A general meeting of the citizens of Peterborough was held about the middle of the month and it was resolved to take a few precautionary steps to ascertain the nature, volume and accessibility of the supply of raw material before the town should commit itself to any scheme for the starting of a smelter.

The stove foundries of Canada are all at work now. The labor troubles that paralyzed production in so many of them last year are settled. But full operation is not an unmixed good. We have too many stove makers, and when their works are all busy there is a certainty that the total output will realize but a filmy profit, which some of the concerns will not be able to offset by economy of management and soundness of accounts. Already there are rumors of weakening in some quarters. Since the dissolution of the Association of Stove Founders competition has been waged pitilessly. Some of the makers within the association had got exasperated with the cutting of outsiders and when the association broke up the outsiders had more cause for regret than the insiders had.

Our furnaces have increased their output of fine irons, but not in foundry grades. Their works are too far east and freights on the Inter-Colonial are too high for it to pay domestic makers to go heavily into foundry grades for western consumers.

An Ishpeming dispatch dated the 22d inst. states that the Chapin Mining Company, operating the Chapin, one of the largest mines in the district, at Iron Mountain has been reorganized. The Vanderbilt and Hanna interests are now predominant in the Chapin Company, and a speedy adjustment of the pay-rolls and other obligations may be looked for. A strange feature of the affair is that M. A. Hanna & Co. and the Vanderbilt interests, the Chicago & Northwestern Railway, which were interested with Ferdinand Schlesinger in the Chapin, were among the parties attaching the Buffalo mine at Neguanee.

At Pittsburgh last week suit of the Siga Iron Company against F. F. Vandervort of that city to recover \$3000, claimed to be due for unpaid subscription on stock of the plaintiff company was filed. The company have \$500,000 of capital stock, divided into 5000 shares of \$100 each. Vandervort, it is stated, purchased 100 shares, but only paid \$70 per share on it. Afterward a

number of assessments, up to the full value of the stock, were made, but he refused to pay them.

#### A Novel Profession.

The host of labor disputes which have marked the past few years in England, and the great loss and inconvenience attendant upon strikes, have caused the evolution of a new profession in that country. There has arisen a class of leaders men, termed "strike beaters," whose business is that of breaking down strikes, not by physical or military force, but by the more peaceful method of doing the work of the strikers until they come to terms. One of the most prominent of these individuals, whose name is Graeme Hunter, is described as a powerful, energetic man in mind and body, who lives with his men, but rules them with strict discipline. His methods are in some respects peculiar, and appear slightly arbitrary to an American mind. As described by English journals, Mr. Hunter's system is as follows: He has the reputation of never interfering in a strike until all means of settling it have been exhausted and he believes the strikers to be in the wrong. Then he simply puts his men to work and keeps them at it. He tells his hands how much he gets to do the job, and the way he makes his own remuneration is by simply dividing the whole amount among them according to their labor, less 1 penny out of every 5 shillings they earn, over and above the expenses incurred. He has under his control some 3200 men, whose average wages are about \$6 a week, besides board and lodging. They are all obliged to live together near to where they may be working, and Mr. Hunter insists on every married man sending home at least £1 a week to his wife, paying them this amount in postal orders, collectible at the home of the wife. Fines are exacted for the absence from work, &c., and no recognition of union rules is had. It is said that eight of his gangs were recently employed at eight ports, including Liverpool, Glasgow, Greenock, Dublin and Bristol, by which it would seem that these men are all-round laborers and not skilled workers.

The smokeless powder adopted by the English Government is known as cordite. It derives its name from its structure, the powder being made up of strings or cords of varying thickness, from  $\frac{1}{16}$  inch to  $\frac{1}{2}$  inch in diameter. The thick cordite is cut in long strips of 14 inches. The cordite used in field guns is cut in strips measuring 11 inches in length. The small-arm ammunition is made up of 60 strands to a load. According to Colonel F. W. Burke of the British artillery the new cordite is a combination of nitro-cellulose and nitro-glycerine. The combination is 37 per cent. gun cotton, 58 per cent. nitro-glycerine, and 5 per cent. vaseline, to which is added a proportion of acetone distilled from wood. The mixture takes on a stringy form. In a magazine rifle a charge of 70 grains of black gunpowder gives a velocity of 1830 feet a second, while 30 grains of cordite gives the same bullet a velocity of 2000 feet.

It is reported that the Llano Furnace & Improvement Company of Llano, Texas, have failed.

## MANUFACTURING.

### Iron and Steel.

The Otis Steel Company, Limited, of Cleveland, Ohio, composed principally of English stockholders, have notified their employees of a reduction in wages varying from 10 to 20 per cent., which went into effect on Monday, the 17th inst. It is claimed by the firm that heretofore they have been paying wages higher than is paid by Pittsburgh competitors, and with the depression existing in business circles this cannot be continued. The wages of the skilled workmen will be reduced about 20 per cent., while unskilled labor will be reduced about 10 per cent. Day laborers have been paid at the rate of \$1.30 per day and this will remain unchanged.

The steel plant of the Bellaire Nail Works, Bellaire, Ohio, has been closed down since June 30 undergoing extensive repairs and will not resume operations for two or three weeks, and possibly latter. The firm have notified their employees that a new scale of wages will go into effect when operations are resumed and which will call for reductions from 5 to 25 per cent.

The Enterprise Boiler Company of Youngstown, Ohio, have a large force of men at work overhauling Carrie Furnace No. 2 of the Carrie Furnace Company, at Rankin, Pa. The stack will be entirely remodeled and new engine and casting houses will be built.

The annual meeting of the stockholders of the Ohio Steel Company, now building a Bessemer plant at Youngstown, Ohio, was held in that city last week. The directory board was increased from seven to eight, as follows: Henry Wick, J. G. Butler, Jr.; Myron Wick, E. L. Ford, E. L. Brown, J. L. Botsford, L. E. Cochran and James Parmlee. The directors organized by electing Henry Wick president; J. G. Butler, Jr., vice-president; and Myron Wick, treasurer. The company now have a force of about 400 men at work on the construction of the plant, but owing to the condition of business and the stringency in the money market operations have not been pushed as actively as would have been the case under other conditions. It is not expected that the plant will be ready for operations before June 1, 1894. The Ohio Steel Company have let a contract to Julian Kennedy, mechanical engineer of Pittsburgh, for the erection of a 34 inch blooming mill.

The plant of the W. Dewees Wood Company at McKeesport, Pa., manufacturers of patent planished sheet iron, which has been undergoing repairs since June 30, has resumed operations in all departments.

It is probable that the Duquesne Tube Works Company of Pittsburgh, with works at Duquesne, Pa., and which went into the hands of a receiver about a month ago, will be granted a five years' extension by the creditors. It is stated that so far all the creditors to whom the agreement has been presented have signed it. The Tyrone Iron Company, Tyrone, Pa., hold a preferred judgment against the concern, but have agreed to stay the execution for a certain time, when it is expected the agreement to an extension will be ratified. Last week a judgment for \$4,301.29 was entered against the Duquesne Tube Works Company by the S. Jarvis Adams Company, Pittsburgh.

Executions aggregating over \$300,000 have been entered against the Douglas Furnaces at Sharpsville, Pa., formerly operated by Pierce, Kelly & Co., but for the past year or more operated under the management of the Douglas Furnace Company. Among the judgments filed was one for \$105,000 in favor of Corrigan, Ives & Co., Cleveland, Ohio; an attachment issued by the Croton Lime Company, Limited, to the amount of \$1:00; one issued by the Exchange National Bank of Chicago for \$25,000; and one by the Wisconsin Marine and Fire Insurance Company Bank for \$125,000.

Summers Brothers & Co., proprietors of the Summers Iron Works, at Struthers, Ohio, signed the Amalgamated Association sheet scale last week, and their plant has resumed operations in all departments.

At a meeting of the directors of the Coleman, Shields Company of Niles, Ohio, held in that city last week, Henry B. Shields was elected president, J. Morgan Coleman vice-president and Dudley B. Shields secretary and treasurer.

The Wheeling Steel Works of the Wheeling Steel & Iron Company, at Wheeling, W. Va., and the steel works of the Junction Iron Company, at Mingo Junction, Ohio, are both closed down undergoing repairs and awaiting a settlement of the steel wage scale. The steel plant of the Riverside Iron Works of Wheeling, W. Va., continues in operation, but is not being operated to its full capacity.

The Tudor Iron Works of St. Louis, Mo., with works at East St. Louis, Ill., signed Amalgamated scale last week.

The Big Stone Gap, Va., iron furnace, which suspended operations about two months ago, went into blast again last week. General Rufus A. Ayers, recently appointed receiver of the furnace, has by his good management enabled the company to pay off all their labor debts, and they are rapidly getting into good shape.

President Prescott of the Embreeville, Tenn., furnace states that the financial trouble of the company has been settled and that they are prepared to meet all of their local and foreign obligations. The furnace will not be put in operation until there is a better demand for iron.

The Lowmoor furnace, at Covington, Va., is preparing to blow out on the first of August. The low price of pig iron and the failure to get lower freight rates are assigned as the cause. It is stated that the Longdale furnace is preparing to shut down August 1 from the same causes.

The West End Furnace, at Roanoke, Va., has been relined and is now being dried out and will probably go into blast the latter part of this week.

The Dayton Coal & Iron Company, Dayton, Tenn., have notified their employees of a cut of 10 per cent. in wages to take effect August 1. The Rockwood furnaces will make a similar reduction and, as it is either a reduction of expenses or shut down, it is believed the workmen will accept the situation.

It is rumored that a few capitalists of the Mahoning Valley have joined issue with others of the Pacific Coast and contemplate building a rolling mill near Los Angeles, Cal. The product is to be sheets and plates. Scrap iron will be the raw material used.

The Midland Steel Company, Muncie, Ind., have shut down their sheet mills and will not resume operations until a better tone pervades the market.

The Irondale Steel & Iron Company, Anderson, Ind., have not started their sheet mills since the annual shut down for inventory and repairs. They will await improved trade prospects before commencing operations.

The sheet mills of Reeves Iron Company, Canal Dover, Ohio, are in operation, after being overhauled and lined up. The bar and guide mills of this plant are still idle.

The Corning Steel Company, Hammond, Ind., are among others waiting for an improvement in trade prospects. This concern manufactures iron and steel sheets. Their plant has been idle since the middle of June.

At Cambridge, Ohio, the Cambridge Iron & Steel Company commenced running their sheet mills full force July 24. Their galvanizing plant is nearly completed and will be in operation in a few weeks.

The New Philadelphia Iron & Steel Company, New Philadelphia, Ohio, will soon commence the erection of a new steel building to be used as an annealing house. This structure will be connected with the sheet mills and an electric crane will run the entire length of both buildings. These sheet mills have commenced operations after the usual summer shut down.

The Riverside Bridge & Iron Works Company of Paterson, N. J., have made an assignment for the equal benefit of their creditors. The Chancellor appointed J. Albert Van Winkle receiver. The liabilities amount to \$122,674.07, while it is claimed by the company that their assets are nominally \$174,206.60. The latter consist of the real estate, contracts on hand, bills receivable, accounts, plant, &c., which are placed at cost in the making of the inventory. The creditors, on the other hand, claim that the assets for liquidation would only realize, if put on sale, \$62,977, which comprises the works, upon which there is a mortgage for \$28,500. The largest creditors are Morris, Wheeler & Co. of Philadelphia; A. & P. Roberts, Philadelphia; Catasauqua Iron Company, Catasauqua, Pa.; the Union Foundry & Machine Company of Allentown, Pa.; the Chester Steel Casting

Company, Chester, Pa.; the Lincoln Iron Works of Philadelphia, Hoops & Townsend and E. T. Day.

The Glendon Iron Company of Easton, Pa., have blown out their furnaces at Glendon on account of the depression in the iron trade, and no definite time has been fixed for their resumption. The plant was established in 1843, the four original stacks comprising it being first blown in in 1844, 1845, 1850 and 1869. Since then the furnaces have been rebuilt, and Nos. 1, 2 and 3 were remodeled in 1888, 1889 and 1890. Three of the furnaces have been out for a long time, but this is the first time since the establishment of the plant that operations have been entirely suspended unless it was to make necessary repairs.

At a meeting of the stockholders of the Ashland Steel Company, held at their office in Ashland, Ky., July 20, the following board of directors was elected: John G. Peebles of Portsmouth, Ohio, W. W. Franklin of Columbus, Ohio, Gazzam Gano of Cincinnati, Ohio, Capt. W. Honshell of Catlettsburg, Ky., John Russell of Ashland, Ky., Robert Peebles of Ashland, Ky., Lindsey Kelly of Ironton, Ohio, B. H. Burr of Ironton, Ohio, I. A. Kelly of Ironton, Ohio. The board organized by the election of officers for the ensuing year as follows: President and general manager, Ironton A. Kelly; vice-president, John Russell; secretary, B. H. Burr; treasurer, L. R. Putnam. The report showed that the business of the past year was profitable and very satisfactory and the output of the plant large, some weeks turning out over 360 tons of finished steel per day of 24 hours.

The repairs to the furnaces of the Ohio Iron Company of Zanesville, Ohio, are progressing rapidly, and operations will probably be resumed within a few days.

The furnace of the Montgomery Iron Company, at Port Kennedy, Pa., has been blown out, and it is the intention of the company to dismantle the present stack, which is a very old one, and erect a new one on improved and more modern plans.

The annual meeting of the Rome Merchant Iron Mill at Rome, N. Y., was held on July 17. The following board of directors was elected: Jim Stevens, Saml. B. Stevens, Charles W. Lee and Saml. Southall. The officers elected were: President, Jim Stevens; vice-president, S. B. Stevens; secretary and treasurer, Chas. W. Lee.

The Robert Donahue Iron and Hardware Company of Burlington, Iowa, have filed articles of incorporation. The capital stock is \$75,000, of which \$65,000 is now paid in.

The laying off of 50 men at the works of the Colorado Fuel & Iron Company, at South Pueblo, Col., give rise to a report that the entire plant was to be closed. This the officials deny, and say that operations will be continued as in the past and no further reduction in force will take place.

The National Furnace at De Pere, Wis., has shut down after a continuous run of two years and eight months. The product in that time was 58,500 tons, said to be the best record for a charcoal furnace on one hearth.

The furnaces of the Tennessee Coal, Iron & Railway Company at Bessemer, Ala., which have been out of blast for several months, resumed operations last week, and now all five of the company's Bessemer furnaces are at work. It is also stated that the company are preparing to put the Alice furnaces in Birmingham in blast. The Tennessee Coal, Iron & Railway Company have 13 iron furnaces in the Birmingham district.

The wire nail and wire rod departments of the Beaver Falls Mills at Beaver Falls, Pa., have been closed down for an indefinite period. During the shut down extensive repairs will be made to the plant.

The Thomas Iron Company of Hocken-dauqua, Pa., have notified their employees of a 10 per cent. reduction in wages to take effect August 1.

All departments of the American Iron & Steel Works of Jones & Laughlin, Limited, at Pittsburgh, except the 26-inch mill, resumed operations in full on Monday morning, the 2d inst.

At Pittsburgh Mackintosh, Hemphill & Co. have entered suit against Chas. H. Read to recover \$4440. The money, it is stated, was loaned to the defendant in different sums between May, 1886, and August, 1887. The total amount loaned was \$5000, on which \$560 has been paid. It was all to be repaid on demand any time after August 16, 1887, but the defendant has refused to pay and the suit is therefore brought.

July 27, 1893

The Sharon Furnace, at Sharon, Pa., formerly operated by Norman Hall, and later leased by Forsyth, Hyde & Co. of Chicago, has been leased by P. L. Kimberly, and will be put into operation, using the ore from Mr. Kimberly's mine in the Me-sabe region. The lessee at one time operated the Keel Ridge Furnace, now dismantled.

#### Machinery.

The Walker Foundry Company of Erie, Pa., have been granted a charter with a capital stock of \$25,000. The new concern are now erecting buildings of brick and wood for the manufacture of gray iron castings. One will be 72 x 108 feet in size and the other 25 x 125 feet. The firm expect to be ready to fill orders about October 1.

The Eastern Forge Works, at East Deering, Me., are undergoing extensive improvements and additions. A 20-ton electric crane is being put in by the Morgan Engineering Works of Alliance, Ohio.

Klug, Baches & Stoll of Milwaukee, Wis., brass founders, will soon begin the erection of a plant at Cudahy. The dimensions are 40 x 80 feet, with a brass-finishing shop 40 x 100 and a pattern shop and boiler room 30 x 62 feet. The entire plant is to be covered with corrugated iron.

The Brown & Sharpe Mfg. Company of Providence, R. I., have discharged about 400 of their hands. They employ about 1000 men, and among those laid off are some of their oldest and most expert workmen. The company say the reason for this large reduction in the working force is simply that there is not a sufficient demand for their product to warrant the keeping of so large a number of hands employed. The entire works will close down two weeks in August for the annual vacation.

The Drop Forge Works at Green Ridge, Pa., have closed for one month to make improvements and introduce new machinery.

About 65 men in the employ of Sargent & Co., New Haven, Conn., struck because a non-union man obtained employment in one of the company's foundries.

The 50 molders who quit work at Smith & Anthony's foundry, Wakefield, Mass., nearly three months ago, because the company refused to give them an increase of 10 per cent., which the men claim had been promised them, have returned to work. They will receive an increase of 3½ per cent., and a more satisfactory adjustment in the laying out of the work.

The Field Force Pump Company, Lockport, N. Y., have secured a large contract to equip a salt water filter plant for Castle Garden, N. Y., aquarium. It is nearly completed and will be shipped in a few days. The central tank in the building is to be 80 feet in diameter, for the purpose of containing a whale. There is a large collection of fish to be accommodated. The filters for the salt water are made of bronze, are 6 feet in diameter and 7 feet high, of which there are two with a capacity of 100,000 gallons each in 24 hours, and the fresh water filters are of steel, of which there are two, 4 feet in diameter and 6 feet high, having a capacity of 55,000 gallons each. The bronze filters are being polished by special machinery made for that purpose, that they may correspond with the finely polished pipes and fittings. As in the filters for the sea water, all stay bolts, rivets, pipes, gate valves and fittings with which the water comes in contact, are either of bronze or gun-metal, and when complete the filtering materials will weigh about 2½ tons each. The water will be taken from New York Bay through a bronze pipe. The pumps for supplying will be of the "Worthington" pattern.

It is very probable that the Boonton, N. J., Tool Company will locate at Utica, N. Y. Secretary William M. Smith, of the concern, has been in that city making arrangements and it is reported that the factory will be in running order at Utica by October 1.

Another manufactory has been added to the Schenectady, N. Y., industry in the shape of William B. Turner's Bellevue Foundry & Machine Works, at Bellevue Park. In another month the new industry will be in operation. The plant has the best of railroad facilities. A double frame two-story structure, 115 x 75 feet, has been erected. The floor space of the foundry is 98 x 113 feet, and a part of the space underneath will be utilized for the storage of material and the cleaning of castings. A convenient arrangement for the transfer of pig iron from the cars to the charging door of the cupola is provided. An electric travel-

ing crane of 20 tons capacity will traverse the entire length of the building. The cupola, which is completed and ready for use, has a capacity of 25 tons, and the blowers, engines, derricks and boiler are all in position. The pattern storehouse is 22 x 120 feet, standing a short distance from the machine shop, and it contains an exceptionally complete line of patterns. The entire equipment for the foundry was obtained of the Geneva Machine Company of Ohio. The machine work will be done in a gallery which extends around the interior of the foundry, and in the manufacture of patterns the works have exceptional facilities. There will be manufactured iron castings of all kinds, together with Mr. Turner's patent compression coupling, which for some years was manufactured by the Edison Company. The plant is furnished with a 40-ton track scales for weighing castings, and four 2-ton scales of Fairbank's make. The stock also includes a large assortment of drawings. The works will start with 75 men and the force will be increased as required.

The Bickford Drill & Tool Company, Cincinnati, Ohio, purchased at the recent auction sale of the tools and machinery of the lately assigned Universal Radial Drill Company all the patterns, drawings, special tools and fixtures formerly used by that company, and are prepared to furnish promptly all repairs and parts for the tools of the company referred to.

The South Florida Iron Works Company will establish an iron foundry at Tampa.

A foundry and machine shop will be erected at Carrollton, Ga., by Frank Marlow and associates.

John Rourke & Son, Savannah, Ga., are preparing to build a large addition to their machine shop and foundry plant, and will add new machinery.

Alfred R. Hughes has recently been admitted as a partner into the firm of the Warren City Boiler Works of Warren, Ohio. Previous to his new connection Mr. Hughes was with Reeves Brothers, boiler manufacturers of Niles, Ohio, for seven years. The plant of the Warren City Boiler Works contains much new machinery, and the firm have excellent facilities for turning out stationary and portable boilers, and all kinds of oil refinery work. At present the firm have some large orders on hand for blast furnace work.

The Cortland Forging Company, Cortland, N. Y., have broken ground for the erection of three new buildings adjoining those now occupied by the company, one to be 48 x 100 feet, one 30 x 36 and one 40 x 18 feet. The buildings will be two stories high and constructed of wood. The intention is to double the capacity of their works. Considerable new machinery will be added, and several new lines of goods will be turned out.

The Laidlaw & Dunn Company of Cincinnati have purchased 12½ acres of land at Hartwell, Ohio, and will build their shops there. The price paid is said to be \$30,000.

#### Miscellaneous.

The annual meeting of the stockholders of the Bridgewater Natural Gas Company was held in Beaver Falls, Pa., on Tuesday, the 18th inst. The following officers were elected: Merritt Greene, president; Henry Hice, vice president; Geo. J. Whiting, treasurer, and Frank Williams secretary and auditor. The report of the treasurer presented at the meeting shows the gross receipts for the year ending on June 30, \$235,582.27; operating expenses, \$67,042.92; net earnings, \$168,539.35; capital stock canceled, \$91,600; present capital stock, \$1,200,000. Indebtedness of \$140,000 was paid during the year.

The Pittsburgh stockholders of the Westinghouse Brake Company, Limited, London, England, have received notice of a semi-annual dividend of 4 percent, payable on July 15 and after.

A few days ago the Greensburg Fuel Company of Greensburg, Pa., in order to test the capacity of the Askins gas plant, from which the town of Greensburg is supplied, put up a 6-inch stand pipe, which was connected with the mains of the Askins plant. For two days and three nights the thick volume of gas which flowed from this pipe was kept burning high in the air, while, at the same time, the town was supplied, as well as the boilers of several factories outside the city. Mr. Askins, in view of this extraordinary test, had prepared to run the three generators connected with this plant, as he did not know how large the demands of the stand pipe might be.

He was agreeably surprised to find that one generator met the demand and that the amount of production was 60,000 cubic feet per hour.

It is stated that the net profits of the Union Switch & Signal Company of Pittsburgh for the five months ending on May 31, 1893, were a trifle less than \$97,000. Adding to this the \$286,086 undivided profits on January 1, 1893, it shows undivided profits on June 1, 1893, of \$382,737.37. Should this rate of increase be maintained throughout the year the net earnings of the concern will approximate \$230,000, or 6 per cent. on the capital stock. The sales for the first five months of 1893 were \$625,530.

The United States Radiator Company of Loyalhanna, Pa., have been granted a charter with a capital stock of \$50,000. The directors are G. C. Blackmore, New York City; D. L. Sloan, C. C. Elwood and C. F. Crawford of Pittsburgh; H. M. Mechling, James A. Shields and Nathan Miles of Greensburg.

The Niagara Radiator Company have been organized with a capital of \$120,000, and may locate a plant for the manufacture of radiators at Tonawanda, N. Y.

The Howe Scale Company of Rutland, Vt., have begun, owing to a scarcity of orders, to work nine hours a day and five days in the week. The working force has also been somewhat decreased.

A Milwaukee dispatch dated the 21st inst. states that malleable iron works at South Milwaukee burned that evening. Loss, \$20,000; insurance, \$8000. The fire caught from a furnace and spread rapidly throughout the building.

The Chateaugay Ore & Iron Company, whose mines and iron foundries are located at Lyon Mountain, N. Y., closed July 20, as did also the Crown Point, N. Y., Iron Company mines and iron makers at Crown Point.

The Southern Malleable Iron Works, Chattanooga, Tenn., are crowded with orders and are employing a larger force of hands than ever before. H. H. Simpers of Pittsburgh, Pa., is now general manager of the plant. They have just booked a \$3000 order for the Southern Erie Car Company and are at work on the necessary iron for 1000 cars for the Missouri Car & Foundry Company. The company are preparing to erect an addition to their plant.

The Middletown Pump Works at Middletown, Conn., will be rebuilt on a larger and more extensive scale.

The American Steel Wheel Company, 143 Liberty street, New York, issue a circular under date of July 17, to the stockholders and creditors of the company, announcing that upon the application of a majority of the stockholders and of more than two-thirds of the creditors, John C. Paul, president of the company, was appointed their receiver by the Chancellor of the State of New Jersey. The stockholders and creditors who joined in this application include, among others, George H. Burt, J. Rogers Maxwell, the Liberty National Bank, the Pond Machine Tool Company, the Garwood Land & Improvement Company, and the Central Railroad Company of New Jersey.

The New Jersey Metal Refining Company's works near Elizabethport, N. J., have been closed, and the officers of the company say the plant will not reopen before September 1. Even then it is doubtful if operations are resumed if the present depression in trade continues.

A legal fight is on between Salt Lake City on the one side and the projectors of the copper plant at that place on the other, the dispute arising over the payment of the bonus.

Creditors of the Terre Haute Car Works Company, representing more than 75 per cent. of the claims, met at Terre Haute, Ind., on the 20th inst., and with no difficulty reached a plan of settlement that will be submitted for approval of the smaller and unrepresented creditors. The creditors chose A. J. Crawford, president of the two rolling mills of Terra Haute, Major Collins of the Central Steel Company, Brazil, and J. F. Brinkman of Terra Haute as trustees. They will recommend the discharge of the assignee, and that the plant be restored to its owners, who will operate it. The company are to be given two years' extension on their paper, 25 per cent. payable every six months. The officers of the company voluntarily agreed to reduce their salaries by one-half. Creditors expressed their gratification at the good showing made, and the works are expected to be in partial operation soon.

# TRADE REPORT

From all parts of the country come the reports of stagnation in the Iron business, and evidence is not wanting that even with the heavy restriction in production the supply overbalances the demand. Forced sales occasionally crop up, and low prices might be more frequently made if there were buyers able and willing to grant favorable terms of payment.

That there are those who have the courage to contract heavily in these critical times is proven by the fact that a Chicago implement manufacturer has bought from a leading Pittsburgh mill 28,000 tons of Steel Bars, for a year's delivery. Other implement makers have also bought or are negotiating.

As throwing light upon the situation in raw materials, we are informed that the contract for West Virginia Coke, concerning which so much has been said lately, was made at a little less than \$1 2¢ ton, and that the Connells-ville interest, after it was closed, offered to do even better than the equivalent, delivered. The Ore situation is virtually unchanged.

The restriction in the make of Pig Iron is proceeding, and four large Pittsburgh furnaces are to be added soon to the idle stacks. There are heavy accumulations of Foundry Iron, which published stock reports fail to account for. There has also been some talk of an auction sale of Iron held by a bankrupt concern in the West. If it were not for the fact that prices are so very low times would look squarely indeed.

There seems no immediate chance for a settlement of the wages scale. The logic of events is decidedly against the men, who have declined to make any concessions on finishing applicable to the great majority of the Western mills. A sliding scale which slides only down to a 2-cent basis for Bars, when the actual selling price is 1.40¢, is a farce.

In Structural Material and in Plates the markets are very dull. The postponement of the Bourse contract for 4000 tons is a characteristic event.

The Steel Rail mills, including the Colorado works, shipped during the first six months a little less than 600,000 tons of Standard Rails. All of them put together have not got orders aggregating 150,000 tons on their books which they dare ship and be sure that they will get their money in any reasonable time. For the next two or three months the outlook in this branch is exceedingly blue.

The Metals are weaker all around.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street.  
CHICAGO, July 26, 1893.

**Pig Iron.**—Trade is now undeniably dull. Everybody admits it. Very little Iron is being shipped from furnaces to consumers, showing that consumption has dwindled to almost nothing. Inquiries are light, and negotiations which seemed quite promising a week ago are not materializing. The people who had expected to be ready to contract for Iron by this time seem to have made up their minds that bargains would soon be offered, and they had better wait for such opportunities. Conditions have grown worse instead of better, and there seems to be no early prospect of an improvement. There is a lack of confidence in every direction, and those who have some desire to sell hardly know whom to trust. Our quotations are conditioned as the nearest obtainable expression of values, but they would be shaded in case of actual transactions. We quote as follows:

Lake Superior Charcoal.....	\$16.00 @	\$16.25
Local Coke Foundry, No. 1.....	13.50 @	14.00
Local Coke Foundry, No. 2.....	12.75 @	13.00
Local Coke Foundry, No. 3.....	12.50 @	12.75
Local Scotch.....	14.00 @	15.00
Ohio Strong Softeners.....	15.75 @	16.25
Southern Silvery, No. 1.....	@	14.50
Southern Silvery, No. 2.....	@	14.00
Southern Coke, No. 2.....	12.75 @	13.00
Southern Coke, No. 3.....	12.25 @	12.50
Southern, No. 1, Soft.....	12.45 @	13.00
Southern, No. 2, Soft.....	12.25 @	12.50
Southern Gray Forge.....	11.50 @	12.00
Tennessee Charcoal, No. 1.....	16.50 @	17.00
Alabama Car Wheel.....	@	18.85
Coke Bessemer.....	14.50 @	15.00
Hocking Valley, No. 1.....	16.75 @	17.00
Jackson County Silvery.....	16.75 @	17.00

**Bars**—A small number of season contracts were placed within the past week by Agricultural Implement manufacturers and there are more on the carpet. These are the only consumers who seem to have any inclination to enter the market. They apparently are impressed by the good prospects for crops of various kinds and see future business. They also evidently believe that they can gain nothing by postponing the placing of their orders. The continued disagreement between the manufacturers and the Amalgamated Association is regarded here with considerable interest, as it had been feared that matters would be adjusted with but a short vacation and that mills would soon start up again and overstock the market, causing prices to become worse than ever. There are some companies even now making exceedingly low offers of Bar Iron out of their mill warehouses for such sizes as they have in stock. Prices for mill shipment for reasonably early Chicago delivery are continued at 1.45¢ @ 1.50¢, half extras, on Bar Iron and 1.65¢, on Soft Steel. Small lots from stock are selling at 1.70¢ @ 1.75¢ for Iron or Soft Steel.

**Structural Material.**—Dealers report themselves fairly busy handling small lots of Beams. There are also numerous small orders coming from the bridge works. The volume of business in this way is quite fair for a time when the mills are closed down. Prices particularly seem to be a little firmer on account of the scarcity of some sizes, but we continue to quote mill shipments at 1.80¢ @ 1.90¢, Chicago delivery; Tees are 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

**Plates.**—Not much business is coming up to test values. The character of

the trade is now such that the stores are usually able to handle anything offered. Concessions are being made in some cases, but prices in the main are about as quoted last week: Mill shipments, Chicago delivery: Tank Steel, 1.75¢ @ 1.85¢; Shell Steel, 2.05¢ @ 2.15¢; Flange Steel, 2.20¢ @ 2.30¢; High Grade Fire Box, 2.75¢ @ 5¢. Store prices are as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.20¢ @ 2.40¢; Shell, 2.35¢ @ 2.50¢; Flange Steel, 2.60¢ @ 2.80¢; Boiler Tubes, 67½ % @ 70 %.

**Sheets.**—No new developments have occurred in the Black Sheet trade. Some contracts have been entered for Black Plates for tinning, but the usual Commercial Sheets are extremely dull. Few mills are quoting prices at present, but No. 27 Common seem to be generally held at 2.90¢ here on mill shipments, while small lots from stock are selling at 3¢. Galvanized Iron is unchanged at 70 and 10 % discount for Juniata, with concessions according to circumstances, and small lots nominally at 70 and 5 % off. Sheet Copper is quoted at 30 and 5 % off for small lots, with concessions according to quantity.

**Merchant Steel.**—Standard mills report more season contracts received, although the volume of business current in that way is not as large as they would like to see at this season. Prospects are not particularly encouraging for the future, yet prices are quite steady at the following rates on mill shipment, Chicago delivery: Smooth Finished Machinery, 1.90¢ @ 2¢; Open Hearth Spring and Smooth-Finished Tire, 2¢ @ 2.10¢; Iron-Finished Tire, 1.70¢; Ordinary Tool, 6¢ @ 7¢; Specials, 12¢ and upward

**Rails and Track Supplies.**—The Steel Rail market is wretchedly dull, but quotations on standard sections are unchanged at \$30 @ \$32, according to quantity. Track Fastenings are quite steady at 1.60¢ @ 1.65¢ for Spike Bars; 2.55¢ @ 2.60¢ for Track Bolts with Hexagon Nuts; and 1.85¢ @ 1.95¢ for Spikes.

**Old Rails and Car Wheels**—Only small transactions are reported in Old Iron Rails, and these are made under stress, so that they may hardly represent the market, which is considered by dealers to be about \$15.50. Old Steel Rails are unchanged at \$9.25 for short pieces and \$13 for long lengths. The nominal quotation on Old Car Wheels in the absence of sales is \$14 @ 14.50.

**Scrap.**—The condition of the Scrap trade steadily grows worse. Dealers have not the courage to make offers for Scrap, as they are unable to see channels through which they may dispose of stock thus acquired. We continue last week's quotations per net ton, with the qualification that sales have been made at lower rates for cash by parties forced to realize. No. 1 Forge, \$12; No. 1 Mill, \$9; Sheet Iron, \$5; Pipes and Flues, \$7.75; Axles, \$18; Horseshoes, \$12; Fish Plates, \$14.50; Spikes and Bolts, \$12.50; Cast Borings, \$5.25; Wrought Turnings, \$7.25; Axle Turnings, \$9; Heavy Cast, \$10; Stove Plate, \$8; Malleable Cast, \$8; Mixed Steel, \$9.50, gross ton; Leaf Steel, \$16.

**Metals.**—Lake Copper is unchanged at 10.75¢ for carload lots and Casting Copper 10.15¢, with concessions for spot cash. Spelter is nominally quoted at 4¢ and Pig Lead at 3.50¢.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., July 25, 1893.

The conditions prevailing in the Iron and Steel trades are not materially different to last week, and, so far as improvement goes, it is useless to expect it for the present. A consideration of the influences which have brought about this condition of affairs would be merely a repetition of what has already been said, and unfortunately there is nothing yet upon which to base any definite argument for better times. Ironmasters have for a long time been doing business in the bare hope of coming out whole, but now it is not so much a question of coming out whole as the one of getting their money without having to wait for a receivership, or something of that kind. This is not an exaggerated statement, but is one that comes up in probably two-thirds of the cases in which there seems to be the chance of getting a little business. This does not imply that the parties are not entitled to credit, but it is a question if they can get their money in time to turn around, or, if their paper is accepted, can it be negotiated? In other words, it is a general loss of confidence, which includes the smallest class of bank depositors up to the very largest capitalists. This is no new experience, unpleasant as it is, neither is it extraordinary that it should occur at this time. The country was never better able to meet a crisis of this kind than it is to-day, and while the stringency and depression may last longer than we are inclined to expect, yet, as sure as night follows day, we shall come out all right, and all the stronger for the experience. There may be more failures, and still more receiverships, but they are not likely to be because of inherent weakness, but more on account of the exigencies of the times. The financial storm is still on, but the total wrecks will probably not be numerous, although a good many stout, well-manned craft may become disabled and require to be taken in tow until they can reach port for repairs.

**Pig Iron.**—It is hardly necessary to say that business is dull, and while there is no great pressure to sell the outlook is far from encouraging. The severe curtailment of production obviates any serious accumulation of stocks, which to that extent is a good thing, and is probably the only thing that could be done to avoid disaster; but it is not much satisfaction to owners to be compelled to keep furnaces idle, or take the chance of something a great deal worse than that. Nevertheless the emergency had to be met, and is being met in a manner which will bring relief some time, and in the meantime places the trade in a measurably safe condition. The situation is so completely dominated by the money market that it is difficult to define the actual position as regards Pig Iron. In general terms it may be said that the supply of good Iron is not large, and that prices are steady, but with such a tremendous decrease in consumption, it is by no means certain that we are not making quite as much Iron as we need, and if the depression continues much longer it may prove to be more than we need. But in any case there is not much chance for lower prices, while there is an absolute certainty that some of these days the upward movement will surprise even the most sanguine people. Meanwhile, however, the demand is for small lots, for which prices are as near the figures quoted herewith

as circumstances will permit, although for spot cash concessions of 50¢ per ton have been made, and in some cases still heavier concessions have been met with, particularly on secondary qualities of Iron. Ordinarily, however, asking prices for Philadelphia and near-by points are about as follows:

American Scotch, No. 1X...	\$16.00	@ \$16.50
American Scotch, No. 2X...	15.00	@ 15.50
Standard Penna. (Lake Ore), No. 1X.	15.00	@ 15.50
Standard Penna. (Lake Ore), No. 2X.	14.00	@ 14.50
Standard Virginia, No. 1X...	14.50	@ 14.75
Standard Virginia, No. 2X...	13.75	@ 14.25
Virginia and Southern, No. 1X, Soft.	14.25	@ 14.50
Virginia and Southern, No. 2X, Soft.	13.50	@ 13.75
Standard Penna. and Vir- ginia Forge	13.00	@ 13.25
Ordinary Forge	12.50	@ 12.75

**Bessemer and Low Phosphorus Pig.**—There is not much demand, but a few lots are selling on the basis of about \$16, delivered for Standard Bessemer, and \$18 @ \$18.25 for Low Phosphorus. The feeling is unsettled however, and consumers are not inclined to operate beyond covering immediate requirements, so that quotations are liable to be influenced by slight pressure in either direction.

**Steel Billets.**—The market is dull and inactive, so much so that it is hardly possible to quote prices based on actual transactions. There are sellers at \$23.50 @ \$24, delivered Philadelphia or equivalent points, but consumers are doing very little business, and are therefore not bidding for material. It is thought that \$23 @ \$23.25 would be promptly accepted for good sized lots, but bids are hard to get, although makers intimate that they would quote low prices for early deliveries and prompt settlements.

**Muck Bars.**—There are sellers at about \$23, delivered, but not much demand at over 1¢ a pound. Some makes are held at a higher figure, while others offer what they claim to be first-class Bars at a shade under \$23, for Philadelphia or equivalent points. There is nothing doing, however, so that prices are more or less nominal.

**Merchant Bars.**—Extremely dull. Some mills claim to be getting 1 60¢ f.o.b. cars, while others are glad to deliver them at 1.55¢. The situation is very unsatisfactory to manufacturers, but unfortunately there is nothing in sight likely to develop immediate improvement. General quotations are 1.60¢ @ 1.65¢ for best refined Bars, city delivery, or 1.50¢ @ 1.55¢ at interior points. Steel Bars 1.50¢ @ 1.80¢, according to quality requirements.

**Skelp.**—There is considerable inquiry, but it is difficult to bring buyers and sellers to an agreement as to prices and terms. For cash settlements 1.50¢ would be accepted for Grooved, and about 1.60¢ for Sheared, but buyers of that class are not easily found in times like these.

**Plates.**—There is nothing but a small hand-to-mouth business, but some of the mills appear to be pretty well employed on that class of work. Ship-work is also being specified for to a moderate extent, but taking the most favorable view of the situation matters are not in good shape. Prices are very low and very weak, and, with so many sellers and so few buyers, there is not much chance of improvement, and, as a matter of fact, manufacturers will consider themselves in good luck if they can continue business at the low figures recently ruling. There is no big work in sight, and no disposition to consider anything of that kind under the finan-

cial conditions which now prevail. For small lots, delivered, asking prices are about as follows:

	Iron.	Steel.
Tank Plates....1.80 @ 1.85¢	1.70	@ 1.75¢
Bridge Plates .....	1.75	@ 1.80¢
Shell.....	2.00	@ 2.15¢
Flange.....2.70 @ 2.90¢	2.20	@ 2.40¢
Fire Box.....3.00 @ 4.00¢	2.50	@ 2.70¢
Special qualities.....	3.25	@ 3.75¢

**Structural Material.**—The only order of any account was that for a new residence at Glenside near Philadelphia, to be built by one of the great sugar magnates. The amount is probably 400 tons Plates and Shapes, the 4000-ton order for the Bourse having again been postponed—perhaps for quite awhile, as the cost of the proposed structure is beyond the amount of cash at their disposal. Prices are very irregular, but for small lots, quotations are about as follows: Beams, Channels or Tees, 1.80¢ @ 2¢, according to size of order; Angles, 1.75¢ @ 1.85¢; Universal Plates, 1.70¢ @ 1.75¢.

**Sheets.**—Considering the general dullness there is a very fair demand for Sheets, but prices are so far down that local mills have hard work to hold their own. Western material is offered at unprecedently low prices, but best makes from mills hereabouts are quoted as follows for small lots :

Best Refined, Nos. 14 to 20...	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24...	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26...	3.15¢ @ 3.20¢
Best Refined, No. 27.....	3.30¢ @ 3.40¢
Best Refined, No. 28.....	3.40¢ @ 3.50¢

Common,  $\frac{1}{4}$ ¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being  $\frac{1}{2}$ ¢ @  $\frac{1}{2}$ ¢ lower than above named :

Best Soft Steel, Nos. 14 to 16...	2 $\frac{1}{2}$ % @ 2 $\frac{1}{2}$ %
Best Soft Steel, Nos. 18 to 20...	2 $\frac{1}{2}$ % @ 3¢
Best Soft Steel, Nos. 21 to 24...	3 $\frac{1}{2}$ % @ 3 $\frac{1}{2}$ %
Best Soft Steel, Nos. 25 to 26...	3 $\frac{1}{2}$ % @ 3 $\frac{1}{2}$ %
Best Soft Steel, Nos. 27 to 28...	3 $\frac{1}{2}$ % @ 3 $\frac{1}{2}$ %

Best Bloom Sheets,  $\frac{1}{4}$ ¢ extra over the above prices.

Best Bloom, Galvanized, dis....70 and 5%

@ 70 and 10%

**Old Material.**—There is rather more inquiry for Old Material, but bids are such that holders do not feel warranted in accepting them. They are willing to accept extremely low figures for cash, but for long time paper they would just as soon have the material, unless the name is really first-class and price somewhere near the figures named herewith—viz : Old Iron Rails, \$16 @ \$16.50, delivered; Old Street Rails, \$18 @ \$19; Old Steel Rails, \$13.50 @ \$14.50; No. 1 Railroad Scrap, \$13 @ \$14, delivered; \$7.50 @ \$8 for clean new No. 2 Light Scrap; \$11 @ \$12 for Machinery Scrap; \$11 @ \$11.50 for Wrought Turnings; \$7 for Cast Borings, and nominally \$20 for Old Fish Plates, and \$18 for Old Car Wheels.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,  
CINCINNATI, July 26, 1893.

There has been a restricted volume on business in Pig Iron during the week, and as the season advances the discouraging features become more pronounced. There has been no relief to the financial stringency prevailing, and some undoubtedly solvent concerns are feeling its influence who never felt it before. It transpires that the prices paid last week for delivery up to April of next year were as low as \$7.50 per ton for Gray Forge and \$8.65 for No. 2 Foundry and possibly less for shorter delivery, f.o.b. Birmingham. The mar-

ket is so much demoralized that nearly every transaction has an independent basis and it may be assumed that where the cash is in sight it brings the Iron at the lowest prices. We hear of many important furnaces blowing out in the South during the week, and yet there is enough Iron offered for the demand, for consumers have apparently suspended operations to an equal extent. There have been sales during the week, mainly in single car lots in this district, but some 500 ton lots and even 1000 ton lots to go east, and nearly all kinds of Iron were taken except Standard Charcoal Iron, which seems to be neglected. We reduce quotations to more nearly represent the current rates prevailing on Southern Iron:

**Foundry.**

Southern Coke, No. 1.....	\$12.75 @ \$13.00
Southern Coke, No. 2.....	11.25 @ 11.50
Southern Coke No. 3.....	10.75 @ 11.00
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 14.75
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2.....	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 1.....	14.75 @ 15.00
Tennessee and Alabama Charcoal, No. 2.....	13.75 @ 14.00

**Forge.**

Gray Forge.....	10.25 @ 10.50
Mottled Coke.....	10.25 @ 10.50

**Car Wheel and Malleable Irons.**

Standard Southern Car Wheel.....	16.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.25 @ 17.50

**Boston.**

Office of *The Iron Age*, 146 Franklin St., Boston, July 25, 1893.

Excessive conservatism prevails in the Iron market throughout. Consumers are not buying beyond actual wants, with the fear that industries may shut down. Machinists are fearing that the mills and works of manufacturers may close, and they are not inclined to load themselves with raw material beyond actual requirements. Still there is not yet any considerable stopping of manufacturing industries, and the extra conservatism of the times is more the result of fear than of actual business depression.

**Pig Iron.**—The trade is quiet in Pig Iron. Still the foundries in New England are well employed, and but for the fear of the stopping of the industries for which they are working they might be free buyers of Iron. The feeling of security in regard to the stability of the market is greater since the announcement of lessened production in June, with probably still greater reduction in July, but the outlook for consumption is not as good as it might be. In quotations no changes are admitted. Southern Iron, ex-dock in Boston, is quoted at: No. 1, \$15 @ \$15.50; No. 2, \$14 @ \$14.50; No. 3, \$13 @ \$14. There is a quiet call for Virginia Iron, with the market at \$15.50 for No. 1, \$14.25 @ \$14.50 for No. 2. These prices are for Iron delivered in Boston. Pennsylvania Iron is dull and nominal here, with quotations for Iron at shipping port at \$14.50 @ \$15 for No. 1; No. 2, \$13.50 @ \$14; Gray Forge, \$13 @ \$13.50. There is a quiet demand for Ohio Irons, with the market quoted at \$17 @ \$17.50 for Iron delivered in Boston.

**Bar Iron.**—Trade is quiet in Bar Iron. Machinists are not heavy buyers by reason of the amount of uncertainty, as mentioned above, while it is the quiet season with blacksmiths. But the New England rolling mills are yet busy, and ordinary old material Bars

are steady at 1.60¢ @ 1.65¢ from mill; from store, 1.65¢ @ 1.70¢. Best Bars from puddled Iron are quotable at 1.80¢ @ 1.90¢ from mill; from store, 1.95¢ @ 2¢. Norway and Swedish Iron is still in rather short supply here. One or two small arrivals have been received this season, but the principal shipments are not in. In the meantime importers are notified of a stronger Swedish market. The little Iron there is in store is quotable at \$66 @ \$70 for Bars and Shapes, though there are some special makes that sell as high as \$72 for Shapes.

**Building Iron.**—Building Iron and Steel is in some demand, and the agents of the principal manufacturers at Pittsburgh and elsewhere note a moderate number of orders for rather smallish lots. Jones & Laughlins' mills at Pittsburgh are running full, and so are the works of Painter & Sons, but these are about the only union mills represented in Boston that are running full. The above mills are in want of orders and doubtless would be inclined to make reasonable concessions for the sake of big orders. But such orders do not seem to be a feature of the market at this time. It is a fact that new building contracts are not generally being made, while if some buildings are not stopped it will not be for lack of a feeling of depression and uncertainty. The quotations on Building Iron and Steel are at: Beams and Channels from mill, 1.90¢ @ 2¢; from store, 2½¢ @ 2¾¢; Tees, 2.25¢ @ 2.30¢ from mill; from store, 2.40¢ @ 2.60¢; Angles, 1.80¢ @ 2¢ from mill; from store, 2½¢ @ 2.35¢.

**Steel, Steel Plates and Steel Rails.**—Steel is steady in prices, but the conservative feeling of the times prevails with all manufacturers and users of Steel. Quotations are: Bessemer Steel, 2¢ @ 2.10¢; Tire and Sleigh Shoe, 1.90¢ @ 2¢; Sheet, 2½¢ @ 2¾¢; American Cast, 6½¢ @ 7¢; English Cast, 13½¢ @ 15¢; American Steel Rails, \$29 at mill. The New England steam roads are not buying Rails to the extent expected early in the season, and the demand from electric roads is not what was anticipated. The Steel Plate mills are in want of orders, but they are done cutting prices, according to the statement of their agents here. Quotations are maintained at: Tank, 1.80¢ @ 1.90¢; Shell, 1.85¢ @ 1.95¢; Refined, 2.05¢ @ 2.12½¢; Fire Box, 2½¢ @ 2¾¢.

**Nails.**—The market on Nails is rather more quiet, owing to the feeling of uncertainty in regard to building, but prices seem to be maintained. Cut Nails, both Iron and Steel, are selling at \$1.40 for large lots and at \$1.45 @ \$1.48 for small lots. Steel Wire Nails are steady, but quiet in demand, at \$1.55 @ \$1.65 to the trade.

**Pipes and Tubes.**—There is still a quiet movement in Pipe. Contracts are being completed, but there is a lack of new contracts. The market is rather in the favor of the buyer, though quotations are nominally unchanged. Boiler Tubes are quiet, with quotations at: 3-inch and over, 67½% off from list; 2½-inch and under, 65% off.

**Scrap Iron.**—The market on Scrap Iron is yet suffering for the want of buyers. There is actually a feeling among Iron experts that there is money in such Iron, bought on the market of to-day and held for better prices. But nobody seems to try it. No. 1 Wrought is quotable at 50¢ @ 55¢, with Old Horseshoes and choice selections at 55¢

@ 60¢. Cast Machine Shop Scrap of the first quality is quoted at 50¢ @ 55¢, but this must not include ordinary Machine Shop Waste. Light Iron is reported still more dull, with the market quoted 30¢ @ 35¢. Turnings are quoted 25¢ @ 30¢ for Cast, and at 30¢ @ 35¢ for Wrought.

**Cleveland.**

CLEVELAND, OHIO, July 24, 1893.

The business outlook has slightly improved locally. It is announced, almost authoritatively, that there is not a local banking institution that is not perfectly sound. Collections are easier, a fact that gives Iron men reason to hope for better things. The city authorities have decided to pay no more than 4% interest on the big issue of bonds about to be sold. It may be determined, however, to emulate Detroit's example and pay the interest on the securities and the bonds themselves in gold. Lake freights for carrying ores are a little higher, but this doesn't signify a great deal, inasmuch as the vessel owners asserted that it was absolutely impossible to continue business at the reduced rates.

**Iron Ore.**—The market continues about as dull and lifeless as it is possible to imagine it to be. An occasional sale of a particularly desirable quantity of Ore is reported, but there is nothing resembling a steady market. The sales of new Ore to date probably do not exceed 2,000,000 tons, whereas early season estimates, made, of course, before the beginning of the present dullness, placed the probable transactions to August 1 at 5,000,000 or 6,000,000 tons. The rate for bringing down Ore from Escanaba is now 50¢ per ton and from Ashland 60¢ per ton. This advance, as slight as it is, has had its effect on the forwarding of Ores from the mines, about 30,000 tons having been unloaded on the local docks during the week just closed. Non-Bessemer Ores have sold since our last report for \$2.75 @ \$2.90 per ton, Cleveland, and Bessemer Hematites at \$3.70 per ton, but the amounts involved were trifling. Production is being curtailed little by little, and only a very small per cent. of the mines in the Lake Superior district are in operation. About 33,000 tons of Ore were sent forward to the furnaces during the past week, as compared with 19,000 tons for the same week last year. The developments of the next few weeks will be watched with the keenest interest.

**Pig Iron.**—Furnacemen are making no efforts to book orders at the present ruinously low figures. Buyers do not seem to be tempted to approach the market by the very low prices now prevailing. Production is so low that some Iron men believe a buying movement cannot much longer be averted. Bessemer Irons are weaker, while Gray Forge and Foundry Irons are scarcely talked of at all. Quotations may be nominally quoted as follows:

Nos. 1 to 6 Lake Superior Charcoal.....	\$15.75 @ \$16.00
Nos. 1, 2 and 3 Bessemer, per ton..	13 @ 13.15
No. 1 Strong Foundry, per ton..	13.50 @ 13.75
No. 2 Strong Foundry, per ton..	12.75 @ 13.00
No. 1 American Scotch, per ton..	14.25
No. 2 American Scotch, per ton..	13.25
Mahoning and Shenango Valley Neutral Mill Irons, per ton..	12.00
Mahoning and Shenango Valley Red Short Mills, per ton..	12.25

**Muck Bars.**—No sales are reported even at \$22 @ \$22.25 for the best grades of Muck Bars.

**Scrap.**—The market continues very dull with no improvement in prices and no sales of any consequence. Cast Borings are quoted at \$5.25; No. 1 Forge at \$12, and Wrought Trimmings at \$7.25 @ 7.50.

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis. July 26, 1893.

**Pig Iron.**—No improvement can be noted in the market since our last report. There have been a number of fairly good sales reported, but prices fail to show any improvement. The fact that production continues to show a steady decrease is offset by the decrease in consumption, and the latter is likely to continue for the next 60 days at least. Manufacturing establishments which closed down on July 1 for repairs do not show any disposition to start up again; and in many instances have sufficient stock on hand to enable them to fill their orders for some time without turning a wheel. Consumers have adopted the plan of buying for a few weeks ahead and cannot be induced to purchase beyond this. The result is that prices are hard to quote, and while those mentioned below are pretty nearly correct, there is a chance of shading them according to the size of the order and the condition of the furnace selling the Iron. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	\$13.00 @ \$13.25
Southern Coke, No. 2 Foundry	11.75 @ 12.00
Southern Coke, No. 3 Foundry	10.75 @ 11.00
Southern Gray Forge	11.00 @ 11.25
Southern Car Wheel	18.00 @ 19.00
Lake Superior Car Wheel	16.75 @ 17.25
Ohio Sofeners	15.75 @ 16.50
Missouri Charcoal, No. 1 Foundry	12.75 @ 13.25

**Bar Iron.**—A moderate business is being transacted on the basis of 1.45¢ @ 1.47½¢ f.o.b. cars East St. Louis. Mills are running half-turn almost entirely. Car works are nearly all closed down, and hesitate to say when they will start up again, and the financial condition precludes the possibility of their doing so for some little time. Jobbers quote 1.60¢ for small lots from store.

**Barb Wire.**—There is no demand whatever for Barb Wire. Carload buyers are not to be found, and mills are shipping smaller quantities of Wire in single orders than they have done for years. Prices are weaker, and while \$2 for carload lots of Painted is a nominal quotation, this price could be shaded without much difficulty. Jobbers ask the usual advance.

**Wire Nails.**—Notwithstanding the fact that mills are pretty generally closed down, there still appears to be plenty of Nails to be had, and at the buyers' own price, too. Building operations have been suspended to a large extent, and stocks continue more than adequate for the demand. The general quotation made by mills is \$1.50 in carload quantities to jobbers. Jobbers quote \$1.60, but report a very light trade.

**Rails and Track Supplies.**—The demand for Steel Rails is unusually light, and prices are unchanged at \$31 to \$31.50. Track Supplies are abso-

lutely lifeless, and are quoted as follows: Splice Bars, 1.70¢; Spikes, 2¢; Bolts, Square Nuts, 2 50¢; with Hexagon Nuts, 2.60¢. Old Rails are offered at \$16 without finding any buyers.

**Pig Lead.**—The market for Pig Lead is in an unsettled condition. A few sales are reported at 3.25¢, but not much is offered at this price.

**Spelter.**—This metal is being offered at all sorts of prices, without much business resulting. The strike in the Kansas district fails to influence the market in any manner whatever. Consumption has fallen off very heavily during the past six weeks, and stocks on hand continue to accumulate.

Ripley & Bronson, dealers in Iron, Steel and Contractors' Supplies, made an assignment to-day. The assets are placed at \$150,000. The liabilities are not given. Failure to negotiate their paper is given as the cause of the suspension. As a result of their failure the St. Louis Steam Heating and Ventilating Company also made an assignment. Assets and liabilities are unknown.

## Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, July 25, 1893.

The same monotonous story regarding the condition of the Iron and Steel trades must again be repeated this week. Business is all but at a standstill, and buyers and sellers alike are reclining on chairs in their offices waiting, Micawber-like, for "something to turn up." The money situation does not improve and until it does, there is little likelihood of an improvement in business. The question then arises, when will the money market improve and what will bring about the improvement. Some believe that to repeal the Sherman Act will at once relieve the situation, while others say that stocks and production must be largely reduced before we will have better times. They argue that just as soon as stocks get low enough to compel buyers to go in the market, just so soon will the situation show improvement. A return of confidence is also undoubtedly necessary and credit lines must be relaxed a little. Officials of the Amalgamated Association claim that as soon as the scale is presented to the manufacturers a large number will attach their signatures to it. In this it is possible they are reckoning without their host, as some that might possibly sign, if the conditions of trade were different, will hold off for a time at least, or may decide to break away and operate with non-union men. Prices on the different Iron and Steel products show little variation, and are mostly nominal, as very few transactions are taking place.

**Structural Material.**—Pittsburgh is bidding on the Shapes to be used in two large buildings at Duluth, Minn. One of them is the Board of Trade Building, which will require some 300 tons of Beams. Outside of these two cases there is nothing special doing, orders being for small lots only. Prices do not show any change one way or the other. There has not been an order large enough to thoroughly test the market for some time. We quote as follows: Beams up to 15 inches, 1.50¢ @ 1.60¢,

f.o.b. cars Pittsburgh; Angles and Universal Plates, 1.60¢ @ 1.70¢; Tees, 1.75¢ @ 1.85¢, and Z-Bars 1.60¢ @ 1.70¢.

**Ferromanganese.**—We make nominal quotations of \$57 @ \$57.50 for domestic, f.o.b. cars Pittsburgh. There is nothing doing.

**Muck Bars.**—There have been some forced sales of Muck Bars made in this market as low as \$21.50, delivered at buyers' mill. At this price it is claimed the seller suffered an absolute loss. These sales have been made by concerns outside of Pittsburgh for the purpose of raising money. The market is represented by the quotation of \$22 for best grades, delivered at buyers' mill.

**Plates.**—Trade is extremely quiet, some of the mills being entirely closed, while others are running to about half capacity. The outlook is not encouraging, and it is believed that the eagerness of the mills to pick up what orders are going will prevent any improvement in prices; while on the other hand it is the impression that prices are probably as low as they will go. The following prices are generally quoted: Tank, 1.50¢ @ 1.60¢; Shell, 1.70¢ @ 1.80¢; Ordinary Fire Box, 2.25¢ @ 2.50¢; Special, 3¢ @ 3.50¢; Flange, 1 75¢ @ 2¢.

**Wire Rods.**—We make nominal quotations of \$27.50 @ \$28, at makers' mill. We are not advised of any transactions since the date of our last report. The Beaver Falls Mills have closed, and it is understood have a very large stock of Rods on hand.

**Wire and Cut Nails.**—A meeting of the Wire Nail manufacturers will be held in the Hotel Duquesne, this city, to-morrow (Wednesday), at 10 a.m. It is understood that the present depressed condition of the trade will be thoroughly discussed, and if possible some plan will be adopted by which the Wire-Nail trade can be lifted out of the rut into which it has fallen and place it on a better basis. The demand for Wire Nails continues light and bids fair to remain so for some time. The Beaver Falls mills have closed for repairs and improvements. We quote Wire Nails at \$1.35 f.o.b. cars Pittsburgh or Cleveland. It is understood that this price is being pretty closely observed. Cut Nails are also in light demand and the market is represented by the quotation of \$1.05 base at maker's mill.

**Bars.**—As yet the Iron scale has not been accepted by a number of manufacturers in this city, and as a result some of the important mills are still closed and will likely remain so for some time. In the Mahoning Valley proper all the mills are closed, only two concerns having signed the Amalgamated scale these being the Pomeroy Mill of the Union Iron & Steel Company and Summers Brothers & Co., at Struthers, Ohio. In addition to the above the Akron Iron Company, at Akron, and the Cherry Valley Iron Works, at Leetonia, have signed and both are in operation. All believe that the trade will be benefited by the idleness of so many mills, which will, of course, take a good deal of product out of the market. Demand continues light and many concerns now idle prefer to remain that way in preference to starting up and selling their product, with a possibility of not getting the money for it. We quote Steel Bars at 1.45¢ @ 1.50¢, half extras, at mill. In the Valley Bars are quoted at 1.40¢ @ 1.42½¢, half extras, at mill.

**Merchant Steel.**—The situation during the past week is unchanged. Many concerns are idle making repairs, and there is not much disposition shown to hurry these in order to get started again. It is announced that the Linden Steel Company of this city will likely come to an agreement with their men in a few days on the wage scale. Prices are without material change and we repeat quotations of last week as follows: Open-Hearth Spring and Tire, 1.90¢ @ 2¢; Machinery, 1.90¢; Curved Sleigh Shoe, 2½¢; Flat Shaped and Sleigh Shoe, 1.90¢; Tool Steel, 5½¢ and upward, according to quality.

**Wire**—Trade is very quiet, and no improvement in demand can be reasonably expected for some time yet. We quote Four Point Galvanized at 2.30¢ and Painted at \$1.90 in carload lots at mill.

**Sheets.**—Specifications on season contracts placed some time ago are now coming in, and these serve to keep fairly busy those mills that are running. Outside of this very little new business is coming in, and it is altogether for small lots. The market may be fairly quoted as follows: Soft Steel Sheets, No. 24. 2 45¢; No. 26, 2 55¢, and No. 27, 2 65¢. There is a fair demand for Galvanized Sheets and we quote best Bloom at 70 and 10 and 5% for fair-sized orders.

**Pipes and Tubes.**—No orders worthy of note have been placed for some time, and the small amount of business doing is for small lots only. Prices have not shown much change lately, for the reason that many of the mills are idle and there is no disposition to force sales. Little or no attention is being paid to the official discount list.

**Coke.**—There is no improvement to note in the Coke trade, either as regards demand or price. Many of the smaller operators in the region have reduced wages, while at other plants, operations have been entirely suspended. The scale provides a minimum basis of \$1 ½ 100 bushels for mining and 55¢ ½ 100 bushels for drawing Coke when the selling price of Coke is \$1.75 ½ ton. Those operators who have cut the wage scale say it is impossible to pay it, and rather than suspend, the reduction is offered. They argue this is a necessity of the situation and is only temporary. The H. C. Frick Coke Company and the McClure Coke Company continue to pay wages based on \$1.90 ½ ton. For the week ending Saturday, July 15, there were 10,368 ovens in the Connellsville region in blast and 6965 idle, with a total estimated production of 87,872 tons. Compared with the production of the previous week this was a decrease of 1531 tons. Both the large and small operators are still blowing out their ovens. Furnace Coke continues to rule at about \$1.25 and Foundry at \$1.75, both in tons of 2000 lbs. f.o.b. cars in Connellsville region.

(By Telegraph, July 26, 12.15 p.m.)

**Pig Iron.**—The market is at a standstill. The Steel plants in this city that are in operation all make their own Pig Iron and consequently are not buyers. The idle Steel plants will not buy any Iron until they have their scales arranged and are ready to start up. While it is true that production shows a large falling off, consumption has also declined to even greater proportions and the outlook cannot be said to be encouraging. In spite of the fact

that buying has been at a standstill for more than a month, prices have been fairly steady, although a good order placed now might shade our lower quotation. The above remarks on Bessemer also apply to Gray Forge and Foundry Iron, there being nothing doing in either kind. We quote:

Neutral Gray Forge	... \$12.00	@ \$12.10	cash.
All-Ore Mill	12.00	@ 12.25	"
Bessemer Pig	13.00	@ 13.25	"
No. 1 Foundry	13.50	@ 13.75	"
No. 2 Foundry	12.50	@ 12.75	"
Charcoal Foundry No. 1	17.00	@ 18.00	"
Charcoal Foundry No. 2	18.50	@ 17.00	"

Gray Forge, at tidewater. Southern Iron, same delivery, \$13.75 @ \$14.50 for No. 1; \$12.50 @ \$13.50 for No. 2; \$12 @ \$12.25 for No. 3; \$12.25 @ \$12.50 for No. 2 Soft, and \$12.75 @ \$13.25 for No. 1 So't. Gray Forge remains \$11.75 @ \$12.50.

**Billets.**—A transaction involving 10,000 tons has been closed, the deliveries being 2000 tons per month, August to December inclusive. This is the only transaction of any magnitude in the Steel market for more than a month. Several other smaller lots are under negotiation, and the market as far as inquiries are concerned, shows improvement. Prices, however, continue low, the market being represented by the quotations of \$20.75 @ \$21, at maker's mill.

## Louisville.

LOUISVILLE, KY., July 22, 1893

The outlook is not encouraging, as money continues close and the inability to discount paper makes it impossible for business to be carried on in the usual channels. There has also been a large falling off in the demand for finished work, and it is among the possibilities that the Pipe shops, which are large consumers of Iron, may shut down in general, and that but few of the car companies will continue to run full. There are many that believe when a revival of business takes place the movement in prices will not be gradual, but that a sharp advance will take place, and that the economy practiced by buyers in ordering as little Iron as possible is causing a heavy shortage in stocks usually carried by consumers, and that a buying movement caused by a scarcity of Iron in any one section may spread into others and lead to higher prices. The present conditions are such that there is no money in making Iron; the cost of Ore and freights are all at bottom, and the only change that can take place to reduce cost is to cut price of labor, which is not disposed to accept further reduction. There is but little movement in Car-Wheel Iron. There is no general concession in prices of Coke Irons save that a few small lots seeking cash customers have been offered at 50¢ @ 75¢ below the market, but the tonnage is insignificant and cuts no figure. We quote cash cars Louisville:

Southern Coke No. 1 Foundry	\$12.75	@ \$13.25
Southern Coke No. 2 Foundry	11.50	@ 12.00
Southern Coke No. 3 Foundry	11.00	@ 11.25
Southern Coke Gray Forge	10.50	@ 10.75
Southern Charcoal, No. 1 Foundry	15.00	@ 16.00
Southern Car Wheel	17.50	@ 17.75
Spathite	11.50	@ 12.50

The manufacturing industries of New England, particularly those of Connecticut and Massachusetts, appear to be the greatest sufferers from the present depression in trade. Large establishments that usually run full at this time of the year are closing their doors, while others are reducing their force one-half or more, and some running on short or half time.

## New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, July 26, 1893.

**Pig Iron.**—The market is very dull, but for standard brands prices are well maintained. We quote Northern brands at \$14.50 @ \$15 for No. 1; \$13.75 @ \$14.50 for No. 2; \$12.25 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13.75 @ \$14.50 for No. 1; \$12.50 @ \$13.50 for No. 2; \$12 @ \$12.25 for No. 3; \$12.25 @ \$12.50 for No. 2 Soft, and \$12.75 @ \$13.25 for No. 1 So't. Gray Forge remains \$11.75 @ \$12.50.

**Spiegeleisen and Ferromanganese.**—There are no inquiries and no sales. Ferromanganese may be nominally quoted at \$56 @ \$56.50.

**Billets and Rods.**—There is absolutely no demand, and the market remains nominally: Domestic Billets, \$23.00 @ \$24, and foreign Billets \$28.25 @ \$28.50, tide water; domestic Wire Rods, \$30.50 @ \$31 and foreign Rods, \$39.75 @ \$40.

**Steel Rails.**—There has been no business in standard sections, but negotiations are pending for at least one good-sized block for a large road. The quotation remains \$29 at mill or tide-water.

**Track Material.**—We quote: Spikes, 1.80¢ @ 1.90¢; Fish Plates, 1.45¢ @ 1.60¢; Track Bolts, Square Nuts, 2.30¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered.

**Manufactured Iron and Steel.**—A central Pennsylvania mill has taken, at a very low price, a contract for about 1500 tons of material for a train shed in Boston, which will take them out of the market for some time. Locally there is very little doing. We quote: Beams upto 15 inch, 1.80¢ @ 2¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.75¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.85¢ @ 2¢, on dock. Steel Plates are 1.65¢ @ 1.90¢ for Tank; 1.95¢ @ 2.10¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.80¢ @ 1.9¢, on dock, and Common 1.45¢ @ 1.60¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.80¢ @ 2.10¢, delivered; Steel Axles, 1.75¢ @ 2¢, and Links and Pins, 1.80¢ @ 2.10¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 80¢ @ 85¢ ½ bundle, at mill.

**Old Material.**—We quote Old Iron Rails at about \$15 @ \$15.50; Old Steel Rails, \$12.50 @ \$13; No. 1 Wrought Scrap Iron at \$15 @ \$15.50, and Car Wheels at \$11.50 @ \$12.

## Metal Market.

**Pig Tin.**—Speculation has been on a smaller scale, and the market has shown weaker tone in the face of steady reduction in the stocks here. General financial uncertainties have more or less unfavorable bearings and offset what strata of strong feature there may be in the position of the market. Prices have dropped to 18.70¢ for prompt delivery, 18.90¢ for August and 19.30¢ for September, a decline of over 4¢ ½ lb during the week. The lowest prices ruled at the close.

**Copper.**—The market has remained very quiet and is bare of distinctly new feature, except that it seems easier to buy at prices that looked exceptionally low last week. Current quotations are

about  $10\frac{1}{2}\%$  for Lake Superior Ingot,  $10\frac{1}{2}\%$  for Electrolytic and  $9\frac{1}{2}\% @ 9\frac{1}{2}\%$  for common casting stock.

**Pig Lead.**—Under continued pressure to sell prompt and near future delivery, prices have declined still further and the market remains in very unsettled condition. Early in the week several hundred tons were sold at  $3.50\%$ , moderate quantities went subsequently at  $3.45\%$ , and finally some good sized lots at  $3.40\%$ . The official bullion price meanwhile dropped to as low as  $3.25\%$ , but reacted to  $3.40\%$ , but actual Lead was on sale at that price at the close.

**Spelter.**—Slow demand, along with continued pressure to sell, have caused a further decline in prices and the market remains in very weak condition. Ordinary brands of Western were sold at  $3.95\% @ 4\%$ , in carload lots, and those figures reflect full market value at the present time.

**Antimony.**—There is only a moderate inquiry and prices are barely steady at  $9\frac{1}{2}\% @ 9\frac{1}{2}\%$  for Hallett's,  $10\frac{1}{2}\% @ 10\frac{1}{2}\%$  for L X, and  $10\frac{1}{2}\% @ 10\frac{1}{2}\%$  for Cookson's, on the spot.

**Tin Plate.**—The demand has shown little if any improvement and the tone of the market for both spot stock and future deliveries continues rather weak, with concession from the prices generally quoted not infrequent. Spot quotations are as follows : Coke Tins—Penlan grade, IC,  $14 \times 20$ ,  $\$5.30$ ; J. B. grade, do.,  $\$5.40$ ; Bessemer full weight,  $\$5.35$ ; light weights,  $\$5 @ \$5.02\frac{1}{2}$  for 100 lb,  $\$4.90$  for 95 lb,  $\$4.80$  for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis,  $\$5.60$ ; Siemens Steel, IC basis,  $\$5.65$ ; IX basis,  $\$6.75$ . Charcoals—Melyn grade, IC,  $\$6.35 @ \$6.37\frac{1}{2}$ ; Crosses,  $\$8$ ; Allaway grade, IC,  $\$5.60$ ; Crosses,  $\$6.80$ ; Grange grade, IC,  $\$5.70$ ; Crosses,  $\$6.85$ . Charcoal Ternes—Worcester,  $14 \times 20$ ,  $\$5.70$ ; do.,  $20 \times 28$ ,  $\$11.35$ ; M. F.,  $14 \times 20$ ,  $\$7.35$ ; do.,  $20 \times 28$ , scarce; Dean grade,  $14 \times 20$ ,  $\$5.30 @ \$5.37\frac{1}{2}$ ; do.,  $20 \times 28$ ,  $\$10.50 @ \$10.60$ ; D. R. D. grade,  $14 \times 20$ ,  $\$5.10 @ \$5.15$ ; do.,  $20 \times 28$ ,  $\$10.10$ ; Alyn,  $14 \times 20$ ,  $\$5.32\frac{1}{2} @ \$5.35$ ; do.,  $20 \times 28$ ,  $\$10.40$ ; Wasters—S. T. P. grade,  $14 \times 20$ ,  $\$4.87\frac{1}{2}$ ; do.,  $20 \times 28$ ,  $\$9.00$ ; Abercarne grade,  $14 \times 20$ ,  $\$4.87\frac{1}{2}$ ; do.,  $20 \times 28$ ,  $\$8.90$ .

## Financial.

News of the series of big bank failures in Denver, Milwaukee, Indianapolis, Louisville and other cities, with a feeling of uncertainty in regard to New England industries, has had a depressing effect on the general financial situation. Nor are there visible many signs of immediate improvement. One healthy indication exists, however, in the active resumption of gold imports. The tide in this quarter appears at last to be turning. Shipments of the precious metal have been received or are on their way which for the time overbalances the outflow. Heavy currency shipments to the West to meet pressing needs, aggregating as they have done some  $\$2,750,000$ , during the first two days of the current week, and the desire of banks to retain ample funds in hand to meet all contingencies have somewhat checked the better feeling which was apparently setting in toward the end of the week in the market for time loans. Money on call on stock collaterals has been fairly easy, varying during the week from 2 to 10 per cent., averaging 4 per cent., and closing on Tuesday at 8 per cent. Liquidation

and the laudable work of banks has tended to keep down rates and maintain an ease which, considering the general unsettled financial situation, would be otherwise somewhat surprising. Time loans aggregating several million dollars were made last week at 7 to 10 per cent. for periods ranging from 30 days to 1 year, and some renewals at 6 per cent. on short terms. The demand in this market is active, but funds can only be obtained on gold-edged securities and when the need is urgent. Commercial paper is stagnant, the few transactions noted being at 8 to 12 per cent. The weekly statement of the Associated Banks on Saturday was more favorable. The gain in specie was  $\$1,584,400$ , and in legal tenders,  $\$503,700$ . There was a decrease of  $\$3,012,555$  in the deficiency of reserve, which now stands at  $\$1,256,550$ . The drain on the resources of New York, which city has practically supplied the needs of the entire country, has been easily met by the New York banks, and it is believed that they will be equal to all the requirements that can possibly arise. New York bankers have been enabled to make moderate purchases of gold abroad on account of the depression in exchange resultant on bills drawn against some recent large purchases of American securities by European investors. Some considerable shipments of silver have been made in the past few days, and the Treasury has purchased 107,500 ounces of the white metal at 69 6 cents. Bar silver in London declined from 33d to 32d., closing at 32 $\frac{1}{4}$ d. In New York the price dropped from 70 $\frac{1}{2}$  cents to 69 cents, closing  $\frac{1}{4}$  cent in advance on Tuesday evening. The Assistant Treasurer on Tuesday settled the Government difference of  $\$604,622$  at the Clearing House in gold. The sum of  $\$400,000$  was paid out at the Sub-Treasury in small bills. Through this operation the Government secured  $\$200,000$  in gold certificates. The Loan Committee of the Clearing House issued  $\$50,000$  of certificates, bringing the total outstanding up to  $\$22,000,000$ .

The Stock Exchange market has seen extraordinary declines in quite a number of good securities, many having reached the lowest point on record, and the situation is such that people are found to declare, in consequence of the surprising drops in stocks already thought to be at the bottom, that things are never so low but that they can go lower. On Thursday an astonishing crash took place in General Electrics, caused by onslaught of the bears, whose recent tactics have been to make unwarranted assaults on particular blocks of stock in order to force them down. So far has this gone that the governors of the exchange were constrained to make a public expression of opinion in regard to the proceedings of certain rumor mongers on the floor of the exchange, which, it is expected, will have a salutary effect. All stocks felt the unfavorable reports from the West, which caused extreme depression during the early portion of this week. Tuesday saw raids on certain railway securities and coal stocks, which caused considerable depression in those stocks. Wednesday brought another break. Some good lots of stocks were secured by European investors within the last few days. The most noticeable changes since Thursday are in stocks named below, the second figures being the prices Wednesday :

Atchison, T. & S. Fe.....,  $17\frac{1}{2}\% to 12\frac{1}{2}\%$   
Am. Sugar Refining Com.....,  $75\frac{1}{2}\% to 70\frac{1}{2}\%$   
Balt. & Ohio.....,  $62\frac{1}{2}\% to 59$

Chicago Gas.....	52 to 48 $\frac{1}{2}\%$
Delaware & Hudson.....	114 $\frac{1}{2}\%$ to 111
Chicago Northern.....	94 $\frac{1}{2}\%$ to 87 $\frac{1}{2}\%$
Chic., B. & Q.....	75 $\frac{1}{2}\%$ to 70
C. C. C. & St. L.....	38 $\frac{1}{2}\%$ to 29
C. Mil. & St. P. Pfd.....	109 $\frac{1}{2}\%$ to 103 $\frac{1}{2}\%$
Del. Lack. & W.....	139 $\frac{1}{2}\%$ to 136
General Electric.....	55 $\frac{1}{2}\%$ to 44 $\frac{1}{2}\%$
Illinois Central.....	86 to 88
Manhattan.....	118 $\frac{1}{2}\%$ to 109 $\frac{1}{2}\%$
Missouri Pacific.....	25 $\frac{1}{2}\%$ to 19
Nat. Lead. Pfd.....	58 $\frac{1}{2}\%$ to 50 $\frac{1}{2}\%$
New Jersey Central.....	95 to 91
St. Paul & Dul.....	30 $\frac{1}{2}\%$ to 27 $\frac{1}{2}\%$
St. Paul & O. Pfd.....	105 to 98
Union Pacific.....	18 $\frac{1}{2}\%$ to 16 $\frac{1}{2}\%$
Western Union.....	75 $\frac{1}{2}\%$ to 71

After the announcement of the Erie receivership the stock dropped to 8 $\frac{1}{2}$  and the preferred to 19.

The bond market was dull last week, but a decided increase in the volume of business in railway and miscellaneous bonds was noted on Monday and Tuesday, the market being, however, weak in tone. Government bonds declined somewhat, a sale of  $\$6500$  U. S. 45s coupons at  $\$110.50$  being recorded. Sterling exchange has been steady but not active, owing to an advance in the rates of discount in the open market in London. Continental exchange is reported as dull and moving in sympathy with sterling. On Wednesday announcement was made that the Erie Railway had again gone into receivers' hands owing to the stringency of the money market precluding the company from obtaining funds to meet outstanding loans.

Wheat and flour were adversely affected by the Western bank failures in common with the stock market. A sharp break occurred in the former staple on Tuesday. Corn shared the depression under the same influences which affected wheat, added to more favorable weather reports. Cotton shows a slight advance, owing, more than anything else, to the drought in Texas.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, July 26, 1893.

Prices for Pig Tin have advanced somewhat, but dealings have been on a moderate scale and outside operators hold aloof pending developments. Australian Tin is 20/ higher owing to scarcity of spot supplies, and spot lots of Straits are held at some advance now that liquidation of speculative contracts is about completed. Spot delivery is now £82. 7/6, and three months' futures are at £81. 17/6 with the market quiet.

The market for Copper is flat at about 5 shillings decline, but the undercurrent seems to have changed somewhat for the better during the past few days, as consumers have manifested more inclination to buy. General trade depression here and unfavorable American advices, along with somewhat free selling on continental account, prevent any decided change for the better. Recent transactions in Furnace Material include 1600 tons Argentiferous Montana matte, to arrive, on terms not made public, Closing prices for Merchant Bars were £42. 10/ for prompt delivery, and £42. 15/ for three months'

futures. Best selected English is about £47. 10/-.

Pig Lead advanced to £10. 2/6, but subsequently reacted to £9. 15/-, and the market at present is flat, with little business doing.

Spelter has met with moderate sale and the market is easy, with sellers at £17. 12/6 for ordinary Silesian.

Tin plate has been in fair demand, chiefly for shipment to Russia and San Francisco, but buyers' and makers' views differed so widely that comparatively little business was executed. Liverpool prices are as follows:

IC Charcoal, Alloway grade.....	13/0 @ 13/6
IC Bessemer Steel, Coke finish.....	12/0 @ ...
IC Siemens .....	12/3 @ ...
IC Coke, B. V. grade, 14 x 20.....	11/9 @ 12/
Charcoal Terne, Dean grade.....	11/9 @ 12/

Steel Rails have receded to £3. 15/- and the market is rather flat at the decline, there being hardly any orders except for small lots. The Pig Iron market is quiet, but prices are remarkably well maintained. Last sales of warrants were at 42/1 @ 42/2 for Scotch, 35/4@ 35/6 for Cleveland, and 44/10 $\frac{1}{2}$  Hematite.

### The German Iron Trade.

(One mark per metric ton is equivalent to 24.8 cents per gross ton.)

DUSSELDORF, July 8, 1893.

The improvement in the Iron and Steel market which was hoped for has not yet made its appearance. The Steel works in particular have reason to complain of lack of work, while in some specialties affairs are growing somewhat better. Prices are quoted as follows: Siegen Spiegeleisen, \$12.40 @ \$12.65; Mill Iron, at furnace, \$10.17 @ \$10.42; No. 1 Foundry Iron, \$15.38; No. 3 Foundry, \$13.14; Bessemer Pig, \$15.62. The Steel works are getting for Basic Ingots \$16.12 @ \$16.62; for Billets, \$17.86 @ \$18.60; and for Slabs, \$19.10 @ \$19.59. For Open-hearth Steel, 24 8¢ @ 29.6¢ more are obtainable.

The cut of the Bar combination of \$2.48 @ \$3.72 per ton has had its effect upon the two works outside of the pool, Thyssen and Westfaelische Stahlwerke. The market has been influenced in a very decided way by this reduction by which Steel Bars are reduced to \$23.56 and Iron Bars to \$26.24.

The business in Beams is quite fair, since the building season is still active. Prices range between \$21.82 and \$22.82. The Plate mills are particularly well supplied with work, but are suffering from low prices, which have declined to \$27.29 @ \$28.52.

The German-American Petroleum Company, which have a monopoly of the American petroleum trade in Germany and have built a number of tanks at many places, have made a profit during the last year of \$1,150,987.35, on a capital of \$4,960,000. In spite of writing off liberally and placing large amounts to surplus funds, a dividend of 23 per cent. was paid, as compared with 20 per cent. in the previous year.

At noon on July 20 1000 boiler makers and their helpers went out on strike in St. Louis. They demanded the working day reduced from 10 to 9 hours with pay for 10 hours. The manufacturers refused to accede to the demand.

### Concerning Heat.

Professor Sells gave a course of lectures in the Old Free Library, Manchester. The conduction and convection of heat were lucidly explained by the lecturer, who illustrated his remarks by means of experiments performed before an oxy-hydrogen lantern, and thrown upon the screen through a double reflector. The transmission of heat through solids differing in amount with different bodies was illustrated by means of heating four bars covered with a thin layer of wax, the bars being of copper, brass, iron and glass. The bars transmitted heat in different proportions, thus melting the wax around them at different times. The copper bar transmitted heat the fastest. The brass and iron bars followed, and the glass was the last to melt the wax. This proved the relative conductivities of certain bodies and illustrated how bad and good conductors could be chosen. Glass, the lecturer said, was almost a non-conductor, while brass was, they all knew, used for pipes in engines. A table of relative conducting power was thrown on the screen. Silver was first, the capacity being taken at 100°, brass followed and bismuth came last, being only 2°. The lecturer here stated that when we became rich enough possibly silver might be used for the improvement of locomotion. An instance of the application of a bad conductor of heat was the asbestos glove used by the firemen of engines for taking up hot bodies without damaging their hands.

The lecturer, by means of placing a sheet of asbestos on his hand, held a ball of red-hot asbestos without experiencing much inconvenience, and by making a hollow in his hand he averred that it was possible for him to hold anything hot on his hand for any length of time. This again introduced the next point of the lecture, viz., the small conductivity of most gases. He said that if he were to put water on his hand he could illustrate that liquids also were bad conductors. Air being a bad conductor of heat, double doors, walls and even double windows should be put in houses. After the same theory, clothing which contained the greatest amount of cells, notably silk, wool and felt, were the warmest because they could store up the largest amount of air.

The lecturer here mentioned the Norwegian cooking box, which is made entirely of felt of various thicknesses. A fire is lit under it and the food is put in to cook and covered in with a felt lid. The fire is allowed to go out and the cooking box may be left for any amount of time up to ten or twelve hours, or until the meal is ready for consumption. This box is not only used for cooking purposes but is also an ice house, as when cool, the box will preserve ice for a long time. This, said the lecturer, was the first time he had heard of a cooking stove being capable of being used as an ice house.

Proceeding, the heating of liquids and gases by transference of particles was illustrated, the heat being applied from below by a Bunsen burner. The heated particles becoming relatively lighter, ascended. This ascension of the heated particles was used in expelling the used-up air from mines. To illustrate this a large test tube was introduced and an oblong body was let down in it so as to cause a narrow passage of air round the side of the test tube in a U shape. At one side a small candle was burning, and at the other side a piece of smoldering brown paper was put. The smoke from the paper

descended on one side and came up at the side the candle was on and out at the top.

### Artificial Stone.

By a new process artificial stone is now manufactured free, it is claimed, from the usual liability to crack or fracture. The process is described by the *Architectural and Building Monthly* as simple, that is, silicic acid, after being ground to powder, is cleansed from all impurities by ordinary means, and 5 to 10 per cent. of it mixed up in warm river or rain water, which is either applied to slackened or well-burnt lime, or is added to hydraulic lime; the resulting product from this process, which is silicate of lime, is mixed with sand and small portions of fluorspar. This mixture may be cast into molds, so as to give various shapes, as desired, and on being removed the castings are allowed to dry for from 12 to 24 hours, after which time they will be as dry as atmospheric air: they are then brought into a steam boiler and steam blown through so as to drive out all air, after which the boiler is hermetically closed up and steam let in under a pressure of 10 atmospheres. In this high pressure steam bath the stones remain from 48 to 72 hours, afterward being submitted to a bath of boiling and saturated chloride of calcium during 6 to 12 hours, also under a pressure of about 10 atmospheres in the same boiler, and the condensed water may be used for the bath. These stones are allowed to dry in the open air, or when desired to dry quickly, steam may be circulated inside of the boiler after the chloride of calcium has been withdrawn and before the stones are taken out. Like ordinary stones these are readily colored or polished.

The following method of bronzing metal articles which are not too heavy for easy handling is recommended by the *Plumber and Decorator*: Thoroughly clean the surface by means of lye and repeated rinsings of cold water, or sandpaper the surface thoroughly clean. If water is used, dry well with a chamois and then heat the article so as to wholly dispel moisture. Now give the surface a coat of shellac, much diluted with alcohol, or a coat of lye. When this is nearly dry proceed in the ordinary manner to apply the bronze, which will adhere to the sticky surface. This plan gives much better results than when the bronze is mixed, because it will not turn black for some time, the reason being that the copper of which the bronze is composed does not come into contact with the metal.

The British Admiralty have placed an order with the French firm, Delaunay, Belleville et Cie., for a battery of boilers of the Belleville type for the torpedo-destroyer "Sharpshooter" of 4000 horse-power, now building in England. This is the first occasion on which such a contract has been placed out of the United Kingdom.

The Benson magnetic iron mines at Little River, N. Y., in the Northwest Adirondacks, have shut down.

The first open-air experiment for a statue in aluminum has just been made in London. It is the figure of an angel placed on the monument recently unveiled in memory of the Earl of Shaftesbury.

# HARDWARE.

## Condition of Trade.

THE INACTIVITY IN BUSINESS which has prevailed since the opening of the month still continues and the volume of trade is small. Jobbers are refraining from pressing sales, and are scrutinizing credits carefully. They are also deferring the placing of their usual orders, and in some cases where their orders have been booked have recently been writing to the factories countermanding portions of the orders or postponing shipments for a few weeks. They are thus evincing a disposition to await the developments of the market, their principal attention being given to collections and financial matters. Manufacturers are pursuing a similar course, and while in many cases curtailing production and carefully avoiding the accumulation of goods, are generally conservative in the marketing of their products and maintaining prices pretty well. In some cases, however, concessions have been made, for the most part, it is thought, under the pressure of financial necessity, in order to realize upon goods in stock. The close prices which have been prevailing on most lines of Hardware prevent the manufacturers, however, from lowering their quotations without incurring actual loss. Retailers also are feeling the stringency in the money market and diminished sales in some sections, owing to the closing of shops and factories, and are buying very sparingly, their orders covering limited assortments of goods of which they are in need. In the present condition of things the trade, both wholesale and retail, are apparently pursuing the policy of keeping their stocks as low as possible, expecting to place their orders when the fall demand sets in. They are thus relying upon the manufacturers to carry the stocks of goods to a greater extent than usual, while the manufacturers, as noted above, are prudently endeavoring to avoid an undue accumulation. The result of this policy will be the production of a considerably smaller quantity of goods than is usual, and if a considerable demand should suddenly set in something

of a scarcity might occur. The trade, however, prefer to take their chances in this matter rather than load up with goods, in the payment for which and subsequent sales they might experience some difficulty. Collections are difficult and only houses who are in an especially favorable condition are availably themselves of cash discounts. There are, however, some indications of improvements in the matter of remittances.

### Chicago.

(By Telegraph.)

The condition of the Hardware trade remains about as stated last week, with trade stagnant but collections steadily working into better shape. Jobbers are reducing expenses in every direction, and are doing very little to force trade, as they are of the impression that it is advisable now to sell only to those who are in need of stock and are able to pay for it. The failure of Parkhurst & Wilkinson of this city, which occurred on Monday, takes down one of the largest and oldest Heavy Hardware houses in the Northwest, whose name has been respected throughout the trade and is synonymous with fair dealing and honest goods. They have the sympathy of the entire trade in the misfortune which has befallen them. Their early resumption is expected, as it seems unreasonable that they will not be able to effect some arrangement with their creditors.

### St. Louis.

(By Telegraph.)

The Hardware trade fails to show any improvement, the greatest complaint being with regard to collections. Money is extremely hard to get, and business is naturally curtailed thereby. The only bright spot is the Southern trade, which promises to be unusually heavy this fall, but even this is likely to fail unless the stringency in the money market disappears. Manufacturers are naming exceptionally low prices for their products, but fail to increase their sales thereby. Retrenchment is the order of the day both in and out of the Hardware trade, and every one is anxious to see what Congress will do, and until this is ascertained any improvement is out of the question.

THE TACK FACTORY of W. W. Cross & Co., Brockton, Mass., was destroyed by fire on the 16th inst. The loss was in the neighborhood of \$80,000, which is nearly covered by insurance. The firm advise us that they will rebuild immediately.

## Notes on Prices.

**Cut Nails.**—Some of the Cut-Nail mills are still in operation, though working on short time and with considerably diminished output. Others, and among them some of the leading ones, are shut down. An accumulation of stock is thus avoided, though there is no difficulty in having orders promptly filled. Prices are pretty well maintained on substantially the same basis as for the past few weeks, namely, \$1.05 for carload lots at mill, a figure which is shaded for Iron Nails, and also in some special cases on Steel Nails. Small lots from store in New York are quoted at \$1.30. The demand is sluggish and the volume of business small.

**Chicago, by Telegraph.**—The Steel-Nail factories are still closed, but there appears to be no difficulty in supplying the trade with all the Nails wanted from stocks carried over in their warehouses. The demand is of such a character that most of it runs to less than carloads. Prices from factory are unchanged at \$1.20 to \$1.25 and from store at \$1.25 to \$1.30, according to quantity.

**Wire Nails.**—Notwithstanding the fact that the mills have been closed during the month, there is no difficulty in the trade obtaining such Nails as they require, even though it is understood that the stocks in manufacturers' hands are not heavy. Quotations are more evenly maintained than for some time past at \$1.35 for carload lots at mill, and the manufacturers are indisposed to shade this price. The question as to what can be done by the manufacturers to give regularity to the market is receiving attention, and some of the manufacturers express confidence that something may be accomplished in this direction. The present unsettled condition of things in the market at large, and the fact that business of late under the very active competition which has existed has been decidedly unsatisfactory, have their influence in overcoming some of the objections which have been entertained by some of the prominent manufacturers to such an arrangement. While nothing definite has as yet been consummated it is regarded as more probable than heretofore that some satisfactory conclusion may be reached, notwithstanding the fact that serious difficulties still remain.

**Chicago, by Telegraph.**—The only demand experienced by manufacturers is for shipments of carloads to scattered



**Glass.**—As is usual with the Glass market at this season trade is quiet and there have been no changes either in demand or prices since our last report. Meetings of the National Glass Company and the Glass workers were held last week, the manufacturers meeting in Chicago and the workers in New York, at which the questions relating to scale were discussed at some length. Committees representing the manufacturers and their employees will soon come together, but the date has not yet been definitely determined. A meeting of the stockholders of the National Glass Company was held in Chicago on July 25, at which a statement was presented outlining the work of the company during the fire just closed. The plant of the Pennsylvania Plate Glass Company has resumed operations, but it is not thought likely that this action on their part will induce other concerns to follow their example. The company are paying former rates, having failed to effect the 10 per cent. reduction in wages which they contemplated. The slight improvement in demand for imported Glass noted last week continues, and we understand that a few large orders have been placed. Quotations on Glass remain unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

### Export Notes.

**A**S EVIDENCE that mill men producing the numerous kinds of Iron and Steel in this country are more and more coming to meet the views of exporters of extended experience in marketing this class of goods abroad, it may be said that the representatives of one of the largest plants in America, who a few months since were lukewarm on the subject, are now actively canvassing for any orders in sight.

In this connection it may be said that a reliable firm of exporters, who ask no credit, recently had in hand orders for about 12 carloads of Galvanized Sheet Iron, suitable for roof tiling, which is coming more and more into use in Spanish America. The greater portion of this is still unplaced.

One of the aggravations of export merchants is to write a manufacturer for quotations on specific goods and

quantities, and have him answer in two or three different communications he does not see how he can compete in his line with foreigners. If the house ordering understand their business it is not necessary for him to see it. That part of the transaction they have been studying both in this and foreign markets, while the manufacturer has mainly confined himself to producing goods. Many conditions have recently changed in this respect. An instance applicable to many cases came to our notice lately. A mill rolling metal for sheathing, out West, sent out not long ago a sample lot, which, proving satisfactory, was quickly followed by a second requisition equal to the amount of the first multiplied by itself, aggregating about \$1000, with the prospect of an increasing business. This opportunity was missed by a concern too cautious to try, where very little was involved in the experiment.

There is a company in this city who have shipped 1000 tons of Sheet Metal since January 1, 1893, to a market that has been open to us on these goods but a year, and which was formerly supplied largely from Great Britain.

The high rate of exchange is more and more causing the erection of manufacturing establishments in Mexico, and making possible the production of goods there. In other words, manufacturing is doubly protected there at the present. While the tariff in that country was designed for revenue only, it really operates in favor of the factor, while the constant depreciation of silver and consequent high rate of exchange tends to decrease imports and increase native production. What is brought in from outside must be paid for in gold, while the labor employed in making goods is paid for in silver. Exchange is now quoted at from 156 to 160. That is, a Mexican merchant must deposit 156 to 160 Mexican silver dollars to obtain 100 gold dollars in remitting his foreign creditor. For a long time, extending over several years, merchants in that country have lived in the hope that exchange would be lower. One merchant in Tampico, something like two years ago, was advised to liquidate his foreign indebtedness, about \$300,000, at the then prevailing rate of exchange, 125. He thought this too high, but eventually paid 145, or \$60,000 more to discharge the same obligation.

A good story illustrative of the merit of some American goods in European markets is told by a merchant who has for years placed large quantities of our products in Great Britain. An English manufacturer of Pumps gave an order for a sample lot of W. & B. Douglas' goods some years ago, which was executed, and, be it said, was the only order given. Within a comparatively short time those identical goods were duplicated by him, but stamped

"Colonial," on which a large local as well as Australian, &c., trade has been built, the trade continuing at the present time. Benjamin Douglas being in England some time after drifted into an agricultural fair in one of the towns, and was attracted by an exhibit of Pumps, which proved to be identical with the "Colonial" pattern, but the closest scrutiny failed to discover the trade name under which the goods were being sold. His suspicions being aroused he became more critical and finally discovered where the "W. & B. Douglas" cast in the goods had been removed and the Pumps refinished. Mr. Douglas' remark to his agent was that it was revenge enough for him, partially reconciling him to loss of considerable trade, that an English maker was exhibiting his (W. & B. Douglas') goods for the purpose of capturing a medal at a county fair.

### Hardware Organizations and the Sherman Bill.

THERE is evidently a disposition on the part of business organizations to take action in favor of the repeal of the Sherman Bill, as referred to in our last issue. The Hardware Board of Trade of New York are circulating a petition to Congress and have already obtained the signatures of many of the hardware houses in the city. New York houses who have not as yet had an opportunity to sign it, as well as merchants and manufacturers out of the city, are invited to express their approval of the petition to the Hardware Board of Trade, 4 and 6 Warren street, New York. The petition to Congress is in the following terms:

The undersigned business men and merchants believing that restoration of confidence is absolutely necessary to avert further disaster, and that it is the duty of our legislators to do everything in their power to bring about such restoration of confidence, respectfully but earnestly urge upon Senators and Representatives at the extra session the following steps:

*First.*—That the purchasing clause of the Sherman Silver Bill be repealed.

*Second.*—That no substitute of any kind whatever be enacted at this session.

*Third.*—That an expert commission be appointed to consider and recommend a scientific plan of currency based on the experience of other countries and adequate to the requirements of a great commercial nation.

We are also in receipt of a circular, sent out by the Merchants and Manufacturers' Association of Baltimore, of which many of the hardware houses in that city are members. The circular, which is being sent to every dealer in their entire market, is as follows:

The Merchants and Manufacturers' Association of Baltimore, representing its commercial and industrial interests, which are in close touch with those of the South and West, appeals to you, personally, to aid in the movement looking to the unconditional repeal of the Sherman Act of 1890.

We ask this because the whole country, from the Atlantic to the Pacific, is threatened with serious dis-

aster. The merchant, the manufacturer, those engaged in agricultural pursuits, the poor and the rich, as well as all wage earners, are likely to suffer severely, unless a speedy remedy is found for the existing financial stringency.

Practical bankers, as well as all other students of finance, throughout the country, with singular unanimity, assert that the present most unfortunate financial situation has been largely brought about by the unwise silver legislation of the past fifteen years. They also claim that if the purchase of silver bullion under the Sherman Act is promptly and unconditionally repealed by the approaching extra session of Congress confidence will at once be restored, and in consequence money will be more plentiful and the agricultural and business interests of the country greatly benefited.

Is it not, then, the duty of merchants manufacturers, agriculturists and all classes to appeal to Congress, on its assembling, to immediately repeal this obnoxious Sherman Bill? And if the better times promised do not speedily come, the various propositions to correct present financial troubles that have been suggested can be considered subsequently by Congress.

Will you, therefore, kindly communicate, either verbally, by letter, or petition, as you may deem best, with the United States Senators from your State and the member of the House of Representatives from your district, and use all the influence you can command to secure his vote and advocacy of the repeal of the Sherman Act, absolutely, without any conditions or substitutes?

Financial men say, with restored confidence there will be abundance of currency and improved business, then let us give their theories a practical test and hold them responsible should their prophecies not be realized.

Kindly write us, and state what action you will take in this matter, and give your views as to the probability of securing its favorable consideration by the Senators from your State and the member of the House of Representatives from your district.

Very respectfully,

DANIEL MILLER, President.

JOHN R. BLAND, Secretary.

## The Columbian Associated Travelers.

FROM ALL ACCOUNTS the biggest crowd of commercial travelers that ever assembled in one place will swoop down upon Chicago this week. They will come from every country in Europe, with a delegation from Australia and from every State in the union. For months the commercial travelers of the United States have been preparing for this week, which is to be their week at the World's Fair. In order to help on the preparations an organization called the Columbian Associated Travelers was formed, and every traveling salesman in the world was made a member of it. The festival of this week will be a reunion of the Columbian Travelers.

Headquarters were opened at the Great Northern Hotel for the reception of the Columbians. The association has heard from about 25,000 members of over 40 organizations of commercial travelers who accepted the invitation to come. Possibly more than that may be in Chicago, and for their enjoyment a varied programme of sightseeing has been laid out.

On Tuesday morning they were to form on the lake front by States and join in a grand street parade. On Wednesday they went to the World's

Fair, where a special programme was prepared for their reception. It was Commercial Travelers' Day at the fair, and it was the intention to make it one of the biggest days the exposition has yet seen.

All the big business houses of Chicago, which employ in the aggregate 15,000 traveling salesmen, gave their men Tuesday and Wednesday in order that they might take part in the demonstration.

The officers of the parade on Tuesday were as follows: Captain E. L. Brand, chief marshal; Major Thomas S. Quincy of Chicago, assistant marshal; Colonel C. S. Young of Massachusetts, C. S. Felton and F. Cusick of Illinois, John C. Whitaker of Ohio, and R. J. Haus of Kansas, aides. The officers of the Columbian Association are:

President—A. J. Dowd.

First vice-president—D. M. Sinsabaugh.

Second vice-president—W. H. Himmel.

Secretaries—G. C. Cooper, James M. Haley, J. A. Ulrich, Edward Butler, Jr.

On Wednesday morning the traveling men began their day at the fair in Festival Hall, where, at 11 o'clock, speeches were made by Mayor Harrison, W. F. Mitchell, of Iowa, and John C. Fenimore, of Ohio. The exposition band furnished music for the occasion. At 3 o'clock in the afternoon the Tattersall military tournament gave a special performance for the travelers, and at the close of the performance the associated American exhibitors met them at the exit of the stock pavilion. A parade was formed, the exhibitors acting as escorts, and the Manufacturers and some of the other buildings were visited. The parade ended at the hall of the American exhibitors, where lunch was served. In the evening there was a magnificent display of fireworks on the lake front east of the Manufactures Building.

Thursday the traveling men will spend at the World's Fair, and Friday will be spent in various excursions.

On Saturday the association will meet in the Hall of Columbus, at the Art Institute for the transaction of general business. Every State in the Union will be represented by delegates, and the Canadian traveling men will also have some delegates there. The representative of the New Zealand commercial travelers arrived in the city on Saturday last, having traveled 9000 miles to be present at the meeting. He is A. F. Whitehouse of Auckland. Mr. Whitehouse packed his grip and turned his face toward Chicago 30 days ago, and it was then midwinter in his country. Harry Bone and James Dovie are the delegates from Australia. Holland will be represented by J. H. Hillebrandt and France by M. Deleage of Lille.

The Travelers' Club has thrown open its clubhouse at 1227 Michigan avenue to the visiting drummers during their stay in the city.

## Trade Items.

CHAS. CHURCHILL, managing director of Chas. Churchill & Co., London, E.C., England, notifies the trade that he will visit the United States during August and September, arriving in New York August 4. Mr. Churchill will endeavor to call upon as many of his friends in this country as possible. Letters may be forwarded to him care of Parke, Davis & Co., 90 Maiden lane, New York, up to August 27, and from August 28 to September 2, care of W. Pickett & Son, 113 Lake street, Chicago. Mr. Churchill will visit the exposition during the latter period.

**REDEKER & ENGLISH** is the style of a firm which has recently engaged in the Hardware business at Kenosha, Wis. They purchased the business formerly conducted by J. B. Hammond & Co., who were successors to L. Bain, Mr. Hammond having been obliged to sell out on account of ill health. Mr. English was a clerk in the store of C. A. Dewey of Kenosha, for 18 years. Mr. Redeker was employed in the same store from 1868 to 1880, but since that time has represented Hibbard, Spencer, Bartlett & Co. of Chicago, in Northern Illinois, Eastern Wisconsin and the northern peninsula of Michigan.

E. M. SARGENT, representing the Supplee Hardware Company, Philadelphia, has issued route list No. 7 for July and August, in which information is given as to his whereabouts during the latter part of July and the first half of August. The first page of the list, which is in the form of a four-page folder, illustrates a man who is engaged in pulling wires, which are fastened in the card-board. Directly below the wires are the following lines:

We're pulling wires all the time  
With the single end in view,  
Of proving it to be a fact  
That our Cutlery will suit you.

**SURPLESS, DUNN & ALDER**, 97 Chambers street, New York, have been appointed sole agents for the Nashville Spoke and Handle Company, Nashville, Tenn., both for domestic and export business. They have also recently concluded negotiations to represent as sole agents the Wrightsville Hardware Company, Wrightsville, Pa., and Self-Acting Bell Company, Lancaster, Pa. They lay emphasis on a fact generally well known that their arrangements with those they represent are strictly on a salary, not commission, basis. Hence their patrons are virtually dealing with the various concerns they act for. The Wrightsville Company are making a miscellaneous line of Shelf Hardware, including Casters, Brackets, Pulleys, Hooks, Latches, Drawer Pulls, Sad Iron Stands, Tack Hammers, Chest Handles, Floral and Garden Tools, &c. The goods made by the Self-Acting Bell Company include automatic and mechanical Door Bells, Bell Pulls and Attachments, Catches, Locks and Hardware Novelties.

WHILE IN HERMANN BOKER & Co.'s store a representative of *The Iron Age* recently observed two rather distinguished looking foreigners, well bronzed by out of door exposure, critically examining a Spencer Repeating Arms Company shot gun, which was soon after purchased. It appeared the gentlemen were officers from one of the ships of the Russian squadron now in these waters, and had seen the guns on exhibition at Chicago. While the firm have posted a notice saying "No guns sold at retail," when foreigners desire to buy American shot guns they offer no obstacles. Four of these guns were sold to officers on the same vessel a few days before. They are used as opportunity offers when ashore on leave.

## Prize Competitions.

THE COMMITTEE to whom the papers in Prize Competition No. 19 were referred have awarded the prizes to the following persons:

First Prize to W. P. STEWART.

Second Prize to W. E. GILL.

Third Prize to W. F. VAN WINKLE.

## Australia.

SIR RODERICK W. CAMERON, who has recently returned from an extended visit to Australia and New Zealand, having left New York early last October, has favored us with some comments pertinent to the situation there, the value of which those knowing the position his firm, R. W. Cameron & Co., has occupied in that trade since the establishment of their Pioneer line of vessels in 1852 will appreciate. Leaving Adelaide the middle of April for London via Suez he spent several weeks in England and was afforded a view of the financial situation in London from inner circles. He is resident commissioner in this country for New South Wales at Chicago, having occupied the same office for that colony in 1876 at Philadelphia, and 1878 at Paris, as well as for Canada, at Sydney in 1879 and Melbourne in 1880.

In his opinion Australia is at once a country of wonderful resources and recuperative powers, the richest per capita, the most extravagant and the worst governed on the globe. The present crisis will weed out the weak concerns and be another illustration of the survival of the fittest. In the end it will be the best thing that could have happened to it. Any substantial improvement there, to his mind, must be preceded by a change in the method of governing. The recent bank failures, with two exceptions, he regards as honest ones, and is confident the money of depositors and, to a great extent, stockholders, will ultimately be made good, although for from three to five years it will be tied up. The banks will pay on an average 5 per cent. on the funds at their command in the meantime. What has really been accomplished by these acts of insolvency in suspending payments is to give financiers there control of immense sums for, say, an average of four years. He instanced one large bank that had paid 25 per cent. dividends for the past 20 years, and others who had declared dividends of from 15 to 17½ per cent. a year. He believed these profits, in the main, to have been honestly earned, although to do this they had necessarily taken large risks. Some of them paid 4 to 5 per cent. on deposits, reloaning it at 6 to 8 per cent. The money is still there, but being advanced on such collaterals as real estate, farms, sheep runs (many of which were only leases), sheep, wool, &c., it would be utterly impossible for them to liquidate as banks here would, where money is put out on call and on from one to four months' time. The large exports bring returns which, if not squandered, must necessarily make them rich. He instanced Sydney and Melbourne as having the best-paved streets in the world — London and Paris not excepted. Their public institutions, buildings and business houses, are remarkably fine. At the present time two of the largest life insurance companies in the world, the Mutual

Life and Equitable, of this city, are putting up buildings in Melbourne and Sydney, the site for one of them costing nearly \$500,000. Indeed, these companies at present are about the only interests spending any considerable sums of money there. He referred to New Zealand as being in good shape, having had their collapse five or six years ago and recovered from it. Street cable lines, or tramways, as they are called there, with fine plants and elegant cars, formerly were filled with people who would ride if for but a block or two, to enjoy the novelty. Now they are comparatively empty, with about the same cost for operating expenses. Stock in one of these lines that has sold above £12 sterling per share has since changed hands at 13 shillings and 6 pence a share. To afford some basis for intelligently understanding the country, the total estimated population in 1892 was placed at 3,984,629 souls, divided as follows:

New South Wales.....	1,197,050
Victoria.....	1,167,329
Queensland.....	421,297
South Australia.....	336,702
Western Australia.....	58,674
Tasmania.....	153,144
New Zealand.....	650,433

An increase over the preceding year of 85,452.

New South Wales produced in 1891 a large variety of staples, among which some of the more important are:

Wool.....	£9,232,672
Live stock.....	2,221,586
Gold, silver, tin and copper.....	5,229,185
Tallow.....	266,670
Meats.....	190,000
Skins.....	188,000
Leather.....	143,000
Fruits.....	176,000

The total customs revenues collected in this Colony in 1890 were £2,214,710. Victoria in 1892 produced a total of £13,266,222, the leading articles being:

Wool.....	£5,938,603
Gold and Silver.....	2,763,563
Live Stock.....	477,000
Tallow.....	156,000
Leather Wares.....	213,000
Skins, Pelts and Hides.....	243,717

Queensland's total in 1890 amounted to £6,604,696, or per capita, £15. 2/6, of which

Wool was.....	£2,524,742
Gold, Silver, Tin, Copper and Lead.....	2,596,563

In South Australia the total for 1890 was £4,410,062.

In conclusion, what is most needed there is satisfactory immigrants, frugal and industrious, who will land with sufficient means to sustain themselves until they can get established.

## Manufacturing.

THE UPSON NUT COMPANY of Unionville, Conn., have sold their machinery for the manufacture of Levels, Try Squares, Bevels and Planes, to the Stanley Rule & Level Company of New Britain, Conn.

THE LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo., have just secured a contract for 40,000 square feet of Wire Cloth for the Missouri Car & Foundry Company, to be used in the

ends and sides of refrigerator cars. Bids were received, we are advised, from every part of the country, and the company feel highly flattered to receive the order in the face of such competition.

JEWELL BELT HOOK COMPANY, Hartford, Conn., advise us that their Potter's Belt Hook business has doubled during the past two years. They refer to the fact that they furnished all the Belt Hooks used in the model paper mill at the World's Fair.

HATCH CUTLERY COMPANY, South Milwaukee, Wis., and 97 Chambers street, New York, issue a circular in which they announce that they have purchased the entire business of the Automatic Knife Company, Middletown, Conn., and will hereafter manufacture that company's complete line of patent Automatic Knives on a larger scale than formerly. They also take occasion in the circular to call attention to their large and complete line of Shears of all kinds, Timers' Snips, Razors, Razor Strips, &c. They also state that they are carrying a full stock of the Christy patent Bread, Carving and Cake Knives at their New York office.

THE CLINTON WIRE CLOTH COMPANY are erecting a new painting tower, which is to take the place of the one destroyed by fire last April. It is of double the capacity of the one destroyed. The brick work is finished and the machinery is ready to place in position as soon as the building is completed. The new three-story mill for weaving Window Screen Cloth is in the hands of the contractor. It is to be 300 feet long and 80 feet wide. The looms in this mill are fitted to weave Steel Wire. It is expected to start these looms before the snow flies, which will greatly increase the output of Window Screen Cloth.

THE WORKS of the McKinney Mfg. Company, Allegheny, Pa., manufacturers of Steel Hinges and Butts, which have been closed down for several weeks undergoing extensive repairs, will start up in all departments on Monday the 24th. The concern advise us that they are ready to fill all orders promptly from stock.

## Alfred Ely & Co.

ALFRED ELY & CO., 46 South Charles street, Baltimore, Md., are distributing a catalogue, just from the press, containing an extensive assortment of Machinists' and Artisans' Fine Tools and Supplies. It contains 332 pages, 9½ x 6½ inches. They have endeavored to make it as nearly complete as possible for all the details pertaining to this class of goods. In arranging the book they have grouped the various lines made by different makers together, to facilitate comparisons and permit of their being readily found. This plan has been adhered to except in the case of a few goods inserted after the book was in the printer's hands. In indexing the work care has been taken to make it as full and complete as possible, to minimize the difficulty of finding goods known by different names. Among the larger assortments found in the catalogue may be noted Calipers, Chucks, Cutters, Drills, Emery Goods, Gauges, Saws, Hammers, Lathes, Oilers, Pliers, Punches, Reamers, Rules, Screws, Scales, Taps and Dies, Vises, Wire and Wrenches.

THE FIRM OF C. C. CLAPPER & CO., Zanesville, Ohio, dealers in Hardware, Harness and Buggies, has been dissolved. C. C. Clapper will continue the business at the old stand.

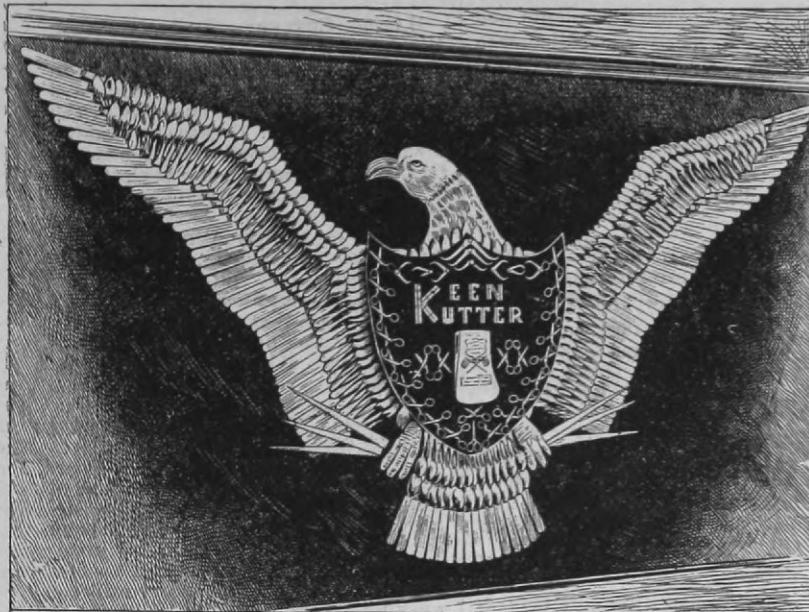
## Simmons Hardware Company's Chicago House.

THE SIMMONS HARDWARE COMPANY of St. Louis, have opened a branch office and sales-room in suite 901 Masonic Temple, Chicago. George P. Mills, a well-

known Hardware salesman of long and varied experience, has been appointed manager. During the World's Fair the customers of this great house will make the new office their headquarters when in Chicago. As goods will be sold by sample, and all shipments made from St. Louis, the arrangement of

Rules, rigging of silver Picture Cord, Pulley Blocks of nickel-plated Padlocks, flags of gold and silver Picture Cord and water of brass Safety Chain. A fourth represents two palmetto trees, the trunks being made of Sash Lifts, leaves outlined in Safety Chain, with veins made of Compasses, date fruit red Padlocks, grass of Sack Needles, mountain in background, outlined in gilt and black Chain, and a setting sun made of a Circular Saw, with rays of Compass Saws, water of silver Picture Cord and shore outlined in gilt Chain. A pot of sunflowers is made of Cupboard Catches, Sheet Brass, Upholsterers' Tacks, gilt Chain and Sash Cord. A blacksmith's display consists of an anvil outlined with Brass Chain, which is surrounded by Horseshoes, Horseshoe Nails and farriers' Hammers, Knives and Rasps.

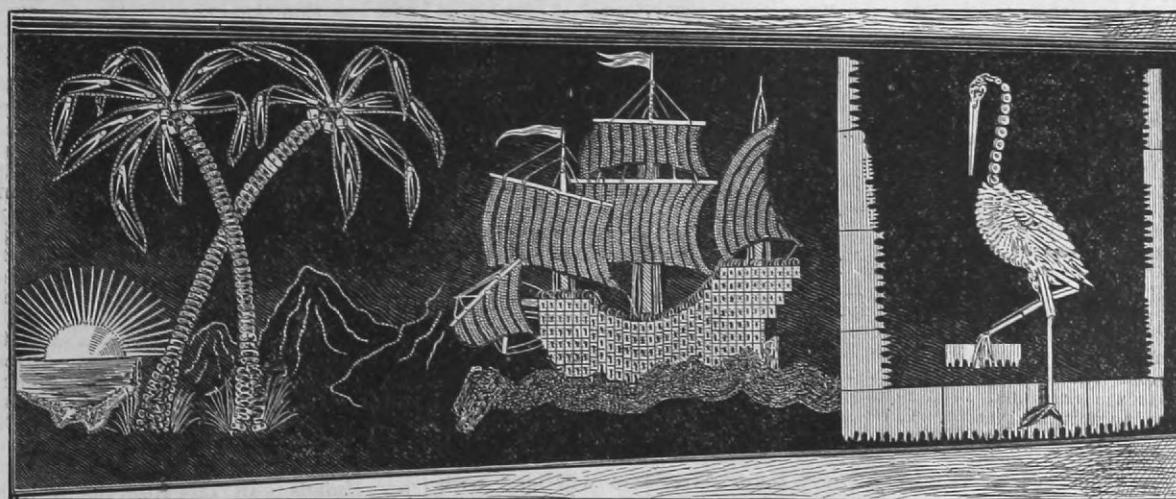
Panels in other parts of the room consist of artistically arranged molders', plasterers', wood turners' and other Tools not usually carried in jobbers' stocks; all kinds of Keen Kutter Auger Bits, Chisels, Draw Knives and Plane Irons; Keen Kutter Files; a great variety of Table Cutlery; Plasterers' and Bricklayers' Tools; all kinds of Keen Kutter Hatchets; True-Blue Hammers and Hatchets; Scythe Blades; Keen Kutter Hand Saws; Hand and Butchers' Saws. Several hexagonal upright revolving cases contain Fishing Tackle and other sporting goods arranged on boards capable of being lifted out for inspection. There are two common-sense revolving Gun cases, constructed to hold 12 Guns and 12 Rifles, in which are displayed a full line of S. H. Co. Royal machine-made Guns. On tables are samples of goods peculiar to the Simmons Hardware Company, such as True-Blue Hammers, True-Blue Braces, Sure Grip Braces, Wightman Braces, Keen Kutter Draw-



*Fig. 1.—Keen Kutter Eagle.*

known Hardware salesman of long and varied experience, has been appointed manager. During the World's Fair the customers of this great house will make the new office their headquarters when in Chicago. As goods will be sold by sample, and all shipments made from St. Louis, the arrangement of

broidery Scissors, surrounding a Keen Kutter Axe and the name Keen Kutter in brass butts. Another design represents a stork, with saw blade bill, calipers for a head, a combination of an upholsterer's Tack and a Curtain Ring for an eye, a neck of nickel-plated Tape Measures, a body



*Fig. 2.—Palmetto Trees, Santa Maria and Stork.*

samples has been made a special feature by the Chicago branch. A vast amount of time and labor has been expended in the preparation of a sample room of such a unique character that it should be seen to be fully appreciated. The wall space, panel between windows and a large post in the center of the room have been decorated with sample boards covered with dark cloth, on which samples have been fastened

of Spoons and Knives, legs of boxwood Rules, claws of Nut Picks, one claw holding a Keen Kutter Saw; a frame of Keen Kutter Saws surrounding the whole. A third is the "Santa Maria," one of Columbus' ships, which has a hull made of a gross of bronze escutcheons, with a rail of Curtain Rings, sails of Upholsterers' White Tacks, seams in sails of gilt Tacks (over 6000 in all), masts of boxwood

ing Knives, Chisels, &c., Axtell Horse Rasps, &c. In racks along the railing which separates the sample room from the office is a full line of Maynard solid socket Steel Shovels, sold exclusively by this house. In a case designed specially by this company is shown a great variety of samples of Keen Kutter Cutlery, such as Pocket Knives, Razors, Scissors, &c. This display is not only most creditable to the house but is an admirable exposition of the artistic capabilities of the usually prosaic Hardware trade.

## World's Fair Exhibits.

LOUIS JORDAN, Gun maker, 71 and 73 Randolph street, Chicago, exhibits four hand-made Arms. They are all double-barreled Shot Guns, breech loading. The workmanship is very fine, as shown by portions of the mechanism displayed. The stocks are ornamented with elaborate etchings.

BARNEY & BERRY of Springfield, Mass., are located in the Manufactures Building, where they make a magnificent display of parlor and ice Skates. Their showcase is unique. It is square, with a silver-plated railing extending all round it at the usual counter height. From this distance upward glass sides taper to the top. A pyramid extends upward from the bottom, and an inverted pyramid hangs down from the top. On the points of these two pyramids are attached two huge silver-plated Skates, beautifully etched. On the sides of the pyramid are arranged silver-plated Skates crossed in pairs. Around the base of the case are shown a variety of Skates very elaborately decorated. This showcase is made of ebony with gold stripes, and attracts as much attention as the jewelry exhibits in other parts of the building.

L. A. BAKER & Co. of Elgin, Ill., exhibit in the Manufactures Building the McCornack Shingle Nailer. This is a device for rapidly nailing shingles on a roof. It consists of a spiral hopper around a tube containing a heavy plunger. Nails dropped into this hopper find their way points down in a slot running almost the full length of the Nailer. When the plunger is pulled up, a Nail slips in place at the bottom, ready to be driven. One stroke of the plunger downward drives the Nail. This can be repeated as fast as a man can raise his hand and lower it, moving the Nailer to a different place at the same time. The mechanism at the point of the Nailer is such that the device does not clog, and the Nails do not crowd. The claim is made that one man can nail shingles as fast as five can lay them in position with a straight edge. A section of a roof is shown with the firm's patent Bracket in place to support a roofer at work. The Bracket is held by ropes, is not nailed to the roof and is adjustable to any slope. The Nailer and Bracket are stated to be readily applicable to laying valleys and making hips.

HATCH CUTLERY COMPANY, South Milwaukee, Wis., make a large display of the goods they manufacture in the Manufactures and Liberal Arts Building. These embrace all kinds of Solid Steel Shears, all fitted with the Hatch bolt; Scissors of every description, and Automatic Penknives, formerly manufactured by the Automatic Knife Company, at Middletown, Conn. These goods are exhibited in a number of very fine upright glass cases, so made that they can be used afterward for the company's purposes. They have in one of these cases, as an exhibition Shear, a pair of Buttonhole Scissors, 24 inches long, nickel-plated and beautifully etched, with a portrait of Columbus and a picture of the caravels on one of the blades. The other specimens shown are, with two or three exceptions, taken directly from stock. A fine line of tinner's Snips is also among the exhibits. These are made with straight or curved handles and in all sizes, fitted with the Hatch bolt. They have been on the market but a short time, yet quite a large trade in them has already been built up. All the Shears, Scissors and Snips are forged from solid steel, making a very substantial article with a thoroughly reliable cutting edge. The various stages through which the steel passes are shown by samples taken from the dif-

ferent departments of the factory. A large number of export orders, we are advised, have been entered since the exposition opened.

EAGLE LOCK COMPANY of 98 Chambers street, New York, whose factories are at Terryville, Conn., in the Manufactures Building, make a very comprehensive exhibit of Locks, for cabinet and trunkmakers' use, and Padlocks. They are shown in upright glass cases, extending around two sides of the company's space, and in a horizontal showcase covering a large part of the center. The Locks are systematically arranged in sets and sizes, and represental styles of finish turned out by the company. From a display of this kind only can a proper conception be formed of the enormous variety of Locks used by cabinet and trunkmakers. Some of the trunk Locks are apparently large and strong enough to fasten a safe. In the collection are shown a few with double catches, one on each side of the Lock, operated by a single key.

THE G. M. SHIRK MFG. COMPANY, 112 and 114 Lake street, Chicago, are manufacturers of the North Star Refrigerator, of which they exhibit fine samples in the Manufactures Building. These consist of a single door, a double door, an apartment house, a top lid and an extra size family Refrigerator with four separate compartments in the lower section. All these Refrigerators are fine specimens of cabinet work in hard wood. The carving adopted by this company is of a distinctive type, which seems remarkably well suited to the purpose, and is highly decorative without being florid. The company also exhibit one of their patent Kitchen Tables or Cabinets. The under part of this Table revolves on a pivot, disclosing a pie board, flour and sugar bins, spice drawers, a rolling-pin holder, &c.

OLIVER AMES & SONS, of North Easton, Mass., do not indicate by the size of their exhibit in the Manufactures Building the importance of their establishment. They have contented themselves with an upright glass case, containing some 20 Shovels and Spades. Included among them, however, are some exhibits of great value. There are a Shovel and a Spade made by Oliver Ames in 1812. They are in a good state of preservation, and were so well made that one can readily see how the reputation of this establishment was built up from the very beginning. Other Shovels and Spades shown are beautifully silver-plated and exquisitely finished in other respects. The samples cover all the principal varieties known to the trade.

WILLIAM ROSE & BROS. of Sharon Hill, Delaware County, Pa., exhibit in an upright mahogany case in the Manufactures Building, a fine assortment of Mechanics' Tools, comprising Trowels and other tools used by masons, plasterers, molders, tanners, Cold Chisels, &c. These samples are attractively arranged, Trowels forming the leading articles in the exhibit, occupying the central space and comprising a great variety of sizes and styles. All are nickel plated, forming a very handsome display.

C. S. OSBORNE & Co. of Newark, N. J., exhibit two large showcases, filled with specimens of their Standard Saddle and Harness Tools, beautifully nickel plated. All kinds of tools are shown which are used in the saddlery and harness trade, including Cutlery, Marking Tools, Punches, Rosette Punches, Pincers, Eyelet Machines, Hammers, Screw Drivers, &c. They also exhibit specimens of their Upholsterers' Tools, Nut Cracks, Gas Pliers and miscellaneous tools. Evidently

as much care has been taken in finishing the handles of these tools as in making the tools themselves. The display is exceedingly creditable throughout.

THE BUFFALO SCALE COMPANY of Buffalo, N. Y., are exhibiting a full line of their well known Scales. They have a handsomely arranged exhibit in the Manufactures Building, Section Q. The space occupied is 73 feet long by 20 feet wide, and here the visitor may see Scales of every description, from the largest Railroad Track Scale to the very smallest Scale for weighing letters. The company have been manufacturing Scales for 30 years, and have within a year or so erected a well-equipped and substantial brick factory having a frontage of 615 feet on Scott, Illinois and Mississippi streets, Buffalo.

WALTER A. WOOD MOWING & REAPING MACHINE COMPANY have installed their exhibit at the Columbian Exposition in Section E, Column J-4, of Implement annex, Agricultural Hall. It is very novel in conception and execution. The fence inclosing it is made entirely of parts of their Agricultural Machinery, the greater portion of which could be taken at any time as repairs to refit their machinery. The top rail is made up of finger bars, the guards pointing upwards. The posts are made of axles and are ornamented with quarter sections of their steel wheels placed on each side of the posts. The remainder of the fence is constructed of every conceivable shape of iron used in their machines, suitable for repairs if needed. The gate is a Tubular Steel Mower wheel and so hung as to swing both ways. The machine exhibit of the company is said by those conversant with agricultural exhibits to be an advance on what has heretofore been done, excelling those of the last Paris Exposition. In the Mowers the wheels and other metal parts have been nickelized and picked out in dark crimson, while the wood has been varnished, showing natural color. The various parts of the other machines exhibited have been finished in the same and other attractive ways.

J. H. STERNBERGH & SON, Reading, Pa., are making three exhibits. One of these is in the Manufactures Building, Section Q, Block 2, and comprises a large variety and sizes of all kinds of Bolts, Nuts, Rivets, Washers, Turnbuckles, and other articles, ranging from Bolts 4 inches in diameter down to  $\frac{1}{4}$  inch diameter. One panel shows their Boiler Rivets in large variety, samples bent and hammered cold into a variety of shapes to show quality; also their Boiler Fitting Up Bolts, Stay Bolts and Tap Bolts. Another panel shows samples of Bolts and Nuts as made 25 years ago, illustrating the lack of standard proportions and sizes as well as the comparatively crude products of that time. On another panel immediately adjoining are samples of Bolts and Nuts as they are made to-day, showing, by comparison, the progress made in the art up to this time. The exhibit in the Transportation Building, Section X N, Post 11, shows a large variety of Bolts used in the construction of cars and locomotives, but it is intended to illustrate more especially the development in the article of Rolled Thread Joint Bolts or Track Bolts for rail fastenings. On one panel is shown iron Track Bolts with the ordinary U. S. standard cut threads fitted with their Ideal Patent Recessed Nuts. On another panel are iron Track Bolts with their patent Harvey grip cut threads, and on other panels their latest production—soft steel Track Bolts with threads produced by the process of cold rolling instead of by the ordinary method of cutting the threads.

with a die. These Track Bolts are referred to as remarkable for their strength, being, it is claimed, as strong, if not stronger, in the threaded portion than in the shank of the bolt itself. The exhibit in Machinery Building, Section 32, Column P 49, shows a novel method of lacing belts with wire, machines for which Messrs. Sternbergh & Son have lately undertaken to manufacture and are now prepared to offer to the trade. At this exhibit they show the various methods in common use of lacing belts, in comparison with their new method of lacing with coiled steel wire. Much interest has already been excited among engineers and other users of belts in machinery department by the simplicity and efficiency of this method of lacing, which they claim is very nearly free from all the objections found in other methods of lacing, and which, on trial at their own works, has proven to be the most satisfactory method of lacing that they have ever employed.

### Price-Lists, Circulars, &c.

**M**ARIETTA MFG. COMPANY, Marietta, Pa., Surplus, Dunn & Alder, General Sales Agents, 97 Chambers street, New York: Catalogue of their Blowers and Portable Forges and Tire Benders. It also illustrates their Marietta and Excelsior Hose Reels, Columbian and Marietta Park Settees, Feed Troughs, &c. Separate circulars are also issued relating to the Reels, Iron Fence, Corn Shellers, Hay Cutters, Grain Fans, &c., which the company are manufacturing.

**N**EW PROCESS TWIST DRILL COMPANY, Taunton, Mass.: Price-list of Tap Drills, Steel Sockets and Steel Sleeves for taper shank drills, New Process Patent Hot Forged Increase Twist Drills, Drills fitting blacksmith's drill presses, Taper Length Drills with one and two shanks for blacksmith's drill presses, Bit Stock Drills, Straight Shank Machine Bits, &c. They also illustrate a Black Walnut Case for holding Drills. The company call special attention to the fact that their Drills are all ground to micrometer caliper gauge.

**S**ELF ACTING BELL COMPANY, Lancaster, Pa., Surplus, Dunn and Alder, general agents, 97 Chambers street, New York: Catalogue, July 1, 1893. The catalogue illustrates the varied line of Self-Acting Door Bells, Catches, Latches, Sash Locks and Sash Fasteners which the company are putting on the market. It also represents a new design of Sash Lift and Egg Holders and Tongs.

**T**ABB & JENKINS HARDWARE COMPANY, Baltimore, Md.: Catalogue, 1893. The catalogue is well printed and consists of 52 large pages, which relate to the varied line of Guns, Air Rifles, Gun Implements, Gun and Rifle Covers, Powder Flasks, Shot Pouches, Shot Belts, Cartridges, Gun Material, Revolvers, Dog Collars, &c., which they are handling as importers, manufacturers' agents and wholesale dealers in Hardware, Cutlery, Guns, &c.

**J.** RUSSELL & CO., Holyoke, Mass.: Wholesale dealers in Hardware, Mechanics' Tools, Mill, Manufacturing and Railway supplies, are distributing an illustrated catalogue and price-list, containing 256 pages, 10 $\frac{1}{2}$  x 7 $\frac{1}{2}$  inches. The book is neatly bound in cloth, with gilt title, front and back. Attention is called in the preface to the large stock carried by them of general Hardware, Builders' Hardware, Farm Tools, Cutlery, Revolvers and House Furnishing

Goods, none of which are shown in this volume. The purpose of this book is to show compactly such tools and supplies as are kept in stock, among which may be noted Planes, Hammers, Hatchets and Axes, Saws, Vises, Augers and Bits, Braces, Chucks, Gauges, Drills, Dividers, Calipers, Wrenches, Pipe Tongs, Files, Oil Stones, Levels, Rules, Oilers, Mill Baskets, Lanterns, Chain, Rope, Rivets, Brushes, Shears, Scales, Safes, Barrows, Nails, &c. It is a convenient and creditable volume.

**M**AST, Foos & Co., Springfield, Ohio: Fence catalogue, No. 9. This catalogue consists of 40 large pages, with excellent illustrations of the goods manufactured by the company in this department of their business. A large variety of styles of Buckeye Wrought and Malleable Iron Fencing are shown, together with Walk Gates, Drive Gates, Gate and Corner Posts, Hitching Posts, Stair Railing, Tubular Iron Railing, Tree and Window Guards, Iron Cresting, Finials, Vases, Vanes, &c. The closing pages of the catalogue illustrate other goods manufactured by the company, including Lawn Mowers, Force and Power Pumps, Wind Engine, Columbia Steel Wind Mill and Buckeye Tank and Spraying Pumps.

### It Is Reported—

That Vensel & English's Hardware store at Butler, Pa., was recently damaged by fire. Loss, \$7000; insurance, \$2500. A. W. Root's Hardware store was also damaged, the loss being about \$2000, with no insurance.

That Thomas Newall has disposed of his Hardware store at Carterville, Mo., to Eli Keller of Webb city.

That the Hardware store of Young, Tuttle & Company, North Berwick, N.H., was burglarized on the 12th inst.

That B. K. Northrup will soon open a new Hardware and Stove store at Westport, N.Y.

That burglars visited the Hardware store of Baldwin Bros., Lincoln, Neb., on the 4th inst. and got away with a quantity of Razors and Shears.

That in a fire at Des Moines, Iowa, on the 5th inst., the Hardware stock of J. A. Garver & Co. was damaged by water to the extent of \$9000.

That Charles Cutler, a Hardware merchant of Baldwin, Kan., was seriously injured while returning home from Lawrence. A runaway team dashed into his light buggy from the rear and completely wrecked it. Mr. Cutler was thrown to the ground and trampled upon by the team. His head was crushed on one side, his body bruised and his back badly wrenches. His condition is serious.

That the Hardware store of Stronk & Le Page, Baldwin, Wis., was broken into by burglars on the 7th inst. and \$200 worth of Cutlery stolen.

That burglars entered the Hardware store of J. W. Seaman, Washington, Pa., on the 6th inst. and got away with \$75 worth of stock, including Revolvers, Razors, Guns, &c.

That John N. Maute will soon erect a large Hardware store on Central avenue, Lancaster, N.Y.

That William Chamberlain has opened a new Hardware store at Dorchester, Mass.

That the Hardware store of Jater & Dixon, Russiaville, Ind., was destroyed by fire on the 6th inst. Loss, \$7000.

That L. E. & E. E. Guignon's Hardware store at Corry, Pa., was damaged by fire on the 7th inst.

That the Robert Donahue Iron and Hardware Company, Burlington, Iowa, have filed articles of incorporation. The capital stock of the company is \$75,000, of which \$65,000 is paid up. The officers are: Robert Donahue, president and treasurer; Geo. Donahue, vice-president and Albert Cobworth, secretary.

That the Hardware store of Houser & Hoeffe, Delaware, Ohio, was slightly damaged by fire on the 13th inst.

That E. C. Howard has taken possession of his new Hardware store at Whitman, Mass.

That Breveton & Gouge, dealers in Hardware, &c., Fillmore, Cal., have sold out.

That D. Rodrick has disposed of his Hardware business at Monterey, Cal.

That Edwards Bros., Hardware dealers, Leipsic, Ohio, were recently damaged by fire.

That English & Vensil, Petrolia, Pa., dealers in Stoves, Hardware and Tin, were visited by fire a short time since.

That E. C. Davault's Hardware store at Farber, Mo., was burglarized on the 13th inst., \$200 worth of goods being taken.

That burglars broke into the Hardware store of T. O. De Jean, Plankinton, S. D., on the 14th inst., and secured some valuable plunder.

That Robert Malstrom's Hardware store at Lake City, Minn., was burglarized on the 14th inst. and \$150 worth of goods stolen.

That T. J. and S. Ulen, Hardware merchants, Dexter, Mo., have sold out, Miller, Riddle & Co. continuing.

That the Hardware firm of John Strandler & Co., Van Wert, Ohio, have dissolved.

That Bartholomew & Withroft's Hardware store at Maxwell, Cal., was destroyed by fire on the 12th inst.

That J. S. Moore has disposed of his interest in the Hardware firm of Barker, Belden & Co., Pittsfield, Mass., to his partners.

### Exports.

**T**HE EXPORTS from the port of New York of merchandise to foreign countries for the months of May and June, 1893, are given below, including Hardware, Machinery, Agricultural Implements and kindred goods. The items for Mexico do not include rail shipments, but only such goods as are carried in seagoing vessels.

ARGENTINE REPUBLIC.	
Mowers and Reapers	Machinery.... \$20,053
Plows and Cultivators	\$297,787 Saws and Tools. 27,001
Other Agriculture	Scalcs and Balances..... 3,089
Impts.	Steam Locomotive Engines. 10,000
Brass and Brass Goods	Steam Stationary Engines. 220
Clocks	Stoves, &c. .... 80
Copper goods	Iron and Steel, all other manufactures. 2,499
Cutlery	Manufactures. 3,866
Firearms	Lamps. .... 3,866
Builders' Hdw.	Plated Ware. .... 8,201
Wire N's, Hoses, Nails, Tacks, &c.	Tinware. .... 660 Wooden Ware. 270

AUSTRIA.	
Firearms	Saws and Tools. \$15
Machinery	4,184
AUSTRALASIA.	
Mowers & Reapers	Scalcs and Balances..... \$1,364
Plows and Cultivators	Steam Fire Engines. 2,526
Other Agriculture	Steam Stationary Engines. 120
Impts.	Stoves, &c. .... 3,882
Brass and Brass Goods	Wire. .... 2,950
Clocks	Iron and Steel, all other manufactures. 15,627
Explosives	Lamps. .... 5,242
Castings	
Cutlery	

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FIREARMS		LEAD & MFRS.	64	BRITISH GUIANA.		DANISH WEST INDIES.		
Builders' Hdw.	58,850	Plated Ware...	4,308	Clocks	\$133	Plows and Cul- tivators	\$11	
Machinery	30,904	Tinware...	1,017	Explosives	34	Reapers	515	
Cut Nails and Spikes	104	Wooden Ware...	4,045	Castings	100	Stoves, &c.	388	
Wire N's. Horse Nails, Tacks, &c	6,820	Zinc, all other manufactures	20	Cutlery...	26	Other Agricult.	Wire	
Saws and Tools	47,541	Emery Wheels	368	Builders' Hdw.	76	Implts.	61	
AZORES, MADEIRA, ETC.		CANARY ISLANDS.		IRON AND STEEL		Saws and Tools		
Clocks	\$20	Iron and Steel, all other man- ufactures	1,017	Clocks	\$133	Stoves, &c.	515	
Builders' Hdw.	11	Manufactures	881	Explosives	34	Other Agricult.	Wire	
Machinery	20	Emery Wheels	65	Castings	100	Implts.	61	
Saws and Tools	616			Cutlery...	26	Iron and Steel, all other man- ufactures	515	
BELGIUM.		Builders' Hdw.	45	Builders' Hdw.	76	Brass and Brass Goods	278	
Mowers and Reapers	\$1,281	Firearms	\$12,934	Machinery	711	Clocks	14	
Plows and Cul- tivators	163	Builders' Hdw.	10,156	Steel Rails	185	Firearms	63	
Other Agricult. Implts.	7,289	Machinery	13,865	Saws and Tools	92	Builders' Hdw.	53	
Brass and Brass Goods	2,210	Wire Nails, Horse Nails, Tacks, &c.	125	Wooden Ware...	20	Machinery	929	
Copper Ingots, Bars and Old.	12,800	Saws and Tools	924	Cut Nails and Spikes	116	Cut Nails and Spikes	6	
Copper Goods	145	Stoves, &c.	1,360			Wooden Ware	84	
Explosives	63	Iron and Steel, all other Mfrs.	2,164					
Castings	70	Lead and Mfrs.	28					
Cutlery	10	Lamps	450					
		Tinware	22					
		Wooden Ware	741					
BERMUDA.		CHILI.		DENMARK.		DUTCH EAST INDIES.		
Plows and Cul- tivators	\$10	Wire Nails, Horse Nails, Tacks, &c.	\$63	Mowers and rea- pers	\$2,158	Mowers and Tools	\$888	
Other Agricult. Implts.	540	Steam Fire En- gines	62	Plows and Cul- tivators	1,824	Stoves, &c.	107	
Brass and Brass Goods	132	Stoves, &c.	393	Other Agricult.	Implts.	Iron and Steel, all other man- ufactures	1,779	
Clocks	235	Wire	130	Impmts.	2,485	Brass and Brass Goods	1,880	
Copper Goods	9	Iron and Steel, all other Mfrs.	973	Clocks	3,910	Clocks	1,252	
Explosives	15	Lamps	359	Firearms	2,484	Firearms	239	
Firearms	25	Lead and Mfrs.	118	Builders' Hdw.	1,381	Builders' Hdw.	550	
Builders' Hdw.	844	Plated Ware...	22	Machinery	2,917	Wooden Ware	25	
Machinery	249	Tinware	183					
Cut Nails and Spikes	124	Wooden Ware	146					
Saws and Tools	60							
BRAZIL.		CHINA.		DUTCH WEST INDIES.		DUTCH EAST INDIES.		
Plows and Cul- tivators	\$2,471	Wire Nails,		Mowers and Tools	\$88	Mowers and Tools	\$888	
Other Agricult. Implts.	2,279	Horse Nails,		Stoves, &c.	1,418	Stoves, &c.	107	
Brass and Brass Goods	7,688	Tacks, &c.		Cut Nails and Spikes	12,014	Other Agricult.	Implts.	1,779
Clocks	20,075	Steam Fire En- gines	62	Plated Ware...	4,264	Impmts.	17,075	
Gunpowder	780	Stoves, &c.	393	Tinware	484	Brass and Brass Goods	1,880	
Other explo- sives	222	Wire	130	Wooden Ware	515	Clocks	1,252	
Car Wheels	140	Iron and Steel, all other man- ufactures	973	Emery Wheels	11	Firearms	239	
Castings	66	Lamps	359			Builders' Hdw.	550	
Cutlery	6,911	Lead and Mfrs.	118			Wooden Ware	25	
		Plated Ware...	22					
		Tinware	183					
		Wooden Ware	146					
BRITISH AFRICA.		CHINA.		DUTCH WEST INDIES.		DUTCH EAST INDIES.		
Mowers and Reapers	\$71,347	Wire Nails,		Mowers and Tools	\$149	Mowers and Tools	\$888	
Plows and Cul- tivators	29,844	Horse Nails,		Stoves, &c.	1,452	Stoves, &c.	107	
Other Agricult. Implts.	17,279	Tacks, &c.		Iron and Steel, all other Mfrs.	645	Other Agricult.	Implts.	1,779
Brass and Brass Goods	4,472	Steam Station- ary Engines..	3,830	Lamps	2,202	Impmts.	17,075	
Clocks	2,268	Steam Boilers		Lead and Mfrs.	7	Brass and Brass Goods	1,880	
Gunpowder	36	and Parts of Engines		Tinware	116	Clocks	1,252	
Other explo- sives	8,485	Copper Goods	613			Firearms	239	
Cutlery	80	Lamps	2,680			Builders' Hdw.	550	
		Other Explo- sives				Wooden Ware	25	
		Bar Iron	635					
		Castings	87					
		Cutlery	566					
		Firearms	3,450					
		Builders' Hdw.	9,359					
		Machinery	19,280					
		Cut Nails and Spikes	710					
		Wire Nails,						
		Horse Nails,						
		Tacks, &c.						
BRITISH EAST INDIES.		COLOMBIA.		ECUADOR.		EGYPT.		
Mowers and Reapers	\$2,059			Mowers and Tools	\$73	Builders' Hdw.	\$44	
Plows and Cul- tivators	17,279			Plows and Cul- tivators	241	Tinware	\$43	
Other Agricult. Implts.	17,279			Brass and Brass Goods	241	Steam Boilers		
Brass and Brass Goods	4,472			Clocks	633	and parts of engines		
Clocks	2,268			Castings	344			
Gunpowder	36			Cutlery	64	Iron and Steel, all other man- ufactures		
Other explo- sives	8,485			Builders' Hdw.	1,232	Builders' Hdw.	1,032	
Cutlery	80			Machinery	2,940	Plated Ware	587	
					Scal	Lead and man- ufactures	857	
					es		597	
BRITISH WEST INDIES.		COSTA RICA.		EGYPT.		ENGLAND.		
Mowers and Reapers	\$2,059			Builders' Hdw.		Mowers and Tools	\$30,055	
Plows and Cul- tivators	17,279			Mowers and Tools		Plows and Cul- tivators	2,550	
Other Agricult. Implts.	17,279			Other Agricult.		Steam Boilers		
Brass and Brass Goods	4,472			Implts.		and Parts of Engines		
Clocks	2,268			Brass and Brass Goods				
Gunpowder	36			Clocks				
Other explo- sives	8,485			Castings				
Cutlery	80			Cutlery				
				Builders' Hdw.				
				Machinery				
BRITISH HONDURAS.		COSTA RICA.		ENGLAND.		FRANCE.		
Agricult. Implts	\$15			Mowers and Tools	\$84,559	Mowers and Tools	\$30,055	
Brass and Brass Goods	78			Stoves, &c.	1,544	Plows and Cul- tivators	2,550	
Clocks	49			Other Agricult.	1,544	Steam Boilers		
Gunpowder	24			Implts.	20,301	and Parts of Engines		
Firearms	185			Brass and Brass Goods	13,790	Stoves, &c.	503	
Builders' Hdw.	98			Clocks	56,988	Iron and Steel, all other man- ufactures		
Machinery	5,389			Copper Ore	61,988	Lamps	5,015	
Cut Nails and Spikes	61			Copper Ingots		Copper Goods		
BRITISH WEST INDIES.		CUBA.				Explosives		
Mowers and Reap- ers	\$222					Car Wheels		
Plows and Cul- tivators	264					Castings		
Other Agricult. Implts.	319					Cutlery		
Brass and Brass Goods	225					Firearms		
Clocks	1,055					Builders' Hdw.		
Gunpowder	3,015					Machinery		
Other Explo- sives	4,173							
Car Wheels	72							
Castings	199							
Cutlery	262							
Firearms	877							
Builders' Hard- ware	3,576							
Machinery	9,939							
Cut Nails and Spikes	2,153							
BRITISH EAST INDIES.		CUBA.		FRANCE.		GERMANY.		
Mowers and Reap- ers	\$222			Mowers and Tools	\$94,712	Machinery	\$54,987	
Plows and Cul- tivators	264			Plows and Cul- tivators	120	Saws and Tools	10,202	
Other Agricult. Implts.	319			Other Agricult.	1,099	Steam Boilers		
Brass and Brass Goods	225			Implts.	28,561	and Parts of Engines		
Clocks	1,055			Brass and Brass Goods	25	Iron and Steel, all other Mfrs.		
Gunpowder	3,015			Clocks	4,510	Lamps		
Other Explo- sives	4,173			Copper Ingots	5,222	Lead and Mfrs.		
Car Wheels	72			Bars and old	4,266	Plated Ware		
Castings	199			Castings	1,540	Tinware		
Cutlery	262			Cutlery	3,594	Zinc Pigs, Bars		
Firearms	877			Builders' Hdw.	13,984	Plates and Sheets		
Builders' Hard- ware	3,576			Machinery	52,288	Zinc, all other manufactures		
Machinery	9,939			Cut Nails and Spikes	212,550	Nickel Oxide		
Cut Nails and Spikes	2,153			Wire	7,313	Zinc Dross		
BRITISH WEST INDIES.		CUBA.				Emery Wheels		
Mowers and Reap- ers	\$222					Platinum Scrap		
Plows and Cul- tivators	264							
Other Agricult. Implts.	319							
Brass and Brass Goods	225							
Clocks	1,055							
Gunpowder	3,015							
Other Explo- sives	4,173							
Car Wheels	72							
Castings	199							
Cutlery	262							
Firearms	877							
Builders' Hard- ware	3,576							
Machinery	9,939							
Cut Nails and Spikes	2,153							
BRITISH EAST INDIES.		CUBA.		FRENCH AFRICA.		GERMANY.		
Mowers and Reap- ers	\$222			Mowers and Tools	\$150	Machinery	\$230	
Plows and Cul- tivators	264			Plows and Cul- tivators		Saws and Tools		
Other Agricult. Implts.	319			Other Agricult.		Steam Boilers		
Brass and Brass Goods	225			Implts.		and Parts of Engines		
Clocks	1,055			Brass and Brass Goods				
Gunpowder	3,015			Clocks				
Other Explo- sives	4,173			Castings				
Car Wheels	72			Cutlery				
Castings	199			Builders' Hdw.				
Cutlery	262			Machinery				
Firearms	877							
Builders' Hard- ware	3,576							
Machinery	9,939							
Cut Nails and Spikes	2,153							
BRITISH WEST INDIES.		CUBA.		FRENCH EAST INDIES.		GERMANY.		
Mowers and Reap- ers	\$222			Mowers and Tools	\$88	Machinery	\$230	
Plows and Cul- tivators	264			Plows and Cul- tivators		Saws and Tools		
Other Agricult. Implts.	319			Other Agricult.		Steam Boilers		
Brass and Brass Goods	225			Implts.		and Parts of Engines		
Clocks	1,055			Brass and Brass Goods				
Gunpowder	3,015			Clocks				
Other Explo- sives	4,173			Castings				
Car Wheels	72			Cutlery				
Castings	199			Builders' Hdw.				
Cutlery	262			Machinery				
Firearms	877							
Builders' Hard- ware	3,576							
Machinery	9,939							
Cut Nails and Spikes	2,153							
BRITISH EAST INDIES.		CUBA.		FRENCH WEST INDIES.		GERMANY.		
Mowers and Reap- ers	\$222			Mowers and Tools	\$297	Machinery	\$230	
Plows and Cul- tivators	264			Plows and Cul- tivators		Saws and Tools		
Other Agricult. Implts.	319			Other Agricult.		Steam Boilers		
Brass and Brass Goods	225			Implts.		and Parts of Engines		
Clocks	1,055			Brass and Brass Goods				
Gunpowder	3,015			Clocks				
Other Explo- sives	4,173			Castings				
Car Wheels	72			Cutlery				
Castings	199			Builders' Hdw.				
Cutlery	262			Machinery				
Firearms	877							
Builders' Hard- ware	3,576							
Machinery	9,939							
Cut Nails and Spikes	2,153							
BRITISH WEST INDIES.		CUBA.		FRENCH EAST INDIES.		GERMANY.		
Mowers and Reap- ers	\$222			Mowers and Tools	\$150	Machinery	\$230	
Plows and Cul- tivators	264			Plows and Cul- tivators		Saws and Tools		
Other Agricult. Implts.	319			Other Agricult.		Steam Boilers		
Brass and Brass<br								

Copper Goods...	458
Explosives...	5,064
Castings...	8,211
Cutlery...	854
Firearms...	28,127
Builders' Hdw...	24,476
Machinery...	82,243
Cut Nails and Spikes...	80
Saws and Tools...	10,642

## GIBRALTAR.

Scales and Balances...	\$135
Clocks...	9932

## GUATEMALA.

Plows and Cultivators...	\$52
Other Agricult. Impls...	981
Brass and Brass Goods...	2,216
Clock...	849
Castings...	35
Cutlery...	38
Builders' Hdw...	1,003
Machinery...	13,921
Cut Nails and Spikes...	127
Wire Nails, Horse Nails, Tacks, &c...	20
Saws and Tools...	3,128

## HAYTI.

Plows and Cultivators...	\$31
Other Agricult. Impls...	16
Brass and Brass Goods...	25
Clocks...	118
Copper Goods...	79
Explosives...	179
Band, Hoop and Scrap Iron...	45
Castings...	48
Cutlery...	369
Builders' Hdw...	4,889
Machinery...	6,782
Cut Nails and Spikes...	1,461
Wire Nails, Horse Nails, Tacks, &c...	146
Steel Plates and Sheets...	124

## HONDURAS.

Brass and Brass Goods...	\$3,178
Copper Goods...	6
Other Expl. Sives...	501
Castings...	622
Cutlery...	42
Firearms...	10,500
Builders' Hdw...	284
Machinery...	3,765
Cut Nails and Spikes...	9

## HONG KONG.

Clocks...	\$6,600
Copper Ingots, Bars and Old...	3,600
Explosives...	580
Firearms...	8,651
Builders' Hdw...	315
Machinery...	1,719
Wire Nails, Horse Nails, Tacks, &c...	250

## IRELAND.

Mowers & Reapers...	\$11,870
Clocks...	375
Explosives...	318
Firearms...	386

## ITALY.

Mowers and Reapers...	\$7,645
Other Agricult. Impls...	386
Copper Ingots, Bars and Old...	24,200
Copper Goods...	1,197
Castings...	237
Firearms...	255
Builders' Hdw...	334

## JAPAN.

Clocks...	\$22,544
Explosives...	778
Car Wheels...	4,088
Firearms...	532
Builders' Hdw...	1,275
Machinery...	4,595
Saws and Tools...	1,340
Scales and Balances...	2,057
Lamps...	1,328

## LIBERIA.

Agricult. Impls...	\$19
Builders' Hdw...	39
Machinery...	27
Cut Nails and Spikes...	26

## MEXICO.

Wire Nails, Horse Nails, Tacks, &c...	\$1,846
Steel Plates and Sheets...	202
Saws and Tools...	28,901
Scales and Balances...	1,473
Steam Stationary Engines...	2,486

Lamps...	174
Lead and Mfrs...	123
Plated Ware...	7,897
Tinware...	288
Wooden Ware...	1,576

## NETHERLANDS.

Mowers and Reapers...	\$6,015
Steam Boilers and parts of engines...	1,221
Stoves, &c...	97
Wire...	1,200
Iron and Steel, all other...	12,496

## NEWFOUNDLAND.

Mowers and Reapers...	\$2,945
Cut Nails and Spikes...	38
Stoves, &c...	2,212
Iron and Steel, all other Mfrs...	2,252
Builders' Hdw...	9461

## NICARAGUA.

Brass and Brass Goods...	\$1,021
Clocks...	144
Copper Goods...	98
Explosives...	13
Castings...	78

## NOVA SCOTIA.

Brass and Brass Goods...	\$1,021
Clocks...	95
Gunpowder...	153
Other expl. sives...	34
Cutlery...	280

## PERU.

Plows and Cultivators...	\$1,065
Clocks...	717
Brass and Brass Goods...	293
Copper Ingots, Bars and Old...	68
Copper Goods...	74

## PHILIPPINE ISLANDS.

Clocks...	\$211
Cutlery...	351
Machinery...	211
Plows and Cultivators...	460

## PORTO RICO.

Plows and Cultivators...	\$2,423
Iron Plates and Sheets...	39
Saws and Tools...	1,518
Scales and Balances...	503
Clocks...	151

## PORTUGAL.

Agricult. Impls...	\$468
Clocks...	4,689
Firearms...	1,739
Builders' Hdw...	2,288
Machinery...	10,898

## ROUMANIA.

Mowers & Reapers...	\$11,425
Clocks...	3,211
Copper Ingots, Bars and Old...	1,060
Gunpowder...	1,440
Oth'r Expl'sives	13,767

Machinery...	\$11,663
Lamps...	115
Zinc Ore...	37
Other Mfrs...	\$10

Mowers & Reapers...	\$11,425
Clocks...	4,675
Other Agricult. Impls...	19,098
Scales and Balances...	4,807

## RUSSIA ON THE BALTIc.

Mowers & Reapers...	\$8,725
Clocks...	2,213
Other Agricult. Impls...	692
Scales and Balances...	410

## RUSSIA IN ASIA.

Mowers & Reapers...	\$175
Clocks...	2,213
Other Agricult. Impls...	1,213
Scales and Balances...	20

## SALVADOR.

Mowers and Cultivators...	\$45
Brass and Brass Goods...	594
Steam Boilers and parts of engines...	585

## SANTO DOMINGO.

Machinery...	\$2,945
Cut Nails and Spikes...	38
Stoves, &c...	2,212
Iron and Steel, all other Mfrs...	2,252
Builders' Hdw...	945

## SCOTLAND.

Mowers and Reapers...	\$8
Clocks...	25
Copper Goods...	141
Gunpowder...	900
Other Expl. Sives...	1,826

## SPAIN.

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Gunpowder ....	570	Steam Boilers and parts of Engines .....	250
Other Explosives .....	112	Stoves, &c.....	369
Castings....	105	Wire .....	16,010
Cutlery....	2,793	Iron and Steel, all other mfrs.	17,508
Ingots, Bars and Rods of Steel..	4,902	Lamps.....	1,624
Machinery.....	10,394	Lead and Mfrs.	2,369
Cut Nails and Spikes .....	138	Plated Ware....	233
Wire Nails,		Tinware.....	450
Horse Nails,		Wooden Ware..	2
Tacks, &c.....	1,282	Emery Wheels..	20

## ALL OTHER COUNTRIES IN AFRICA.

Clocks.....	\$97	Machinery.....	\$80
Explosives.....	973	Saws and Tools.	152
Firearms.....	4,587	Lamps.....	38
Builders' Hdw..	69		

## ALL OTHER COUNTRIES IN ASIA.

Agricult. Im- pits.....	\$4,980	Stoves, &c.....	\$36
Builders' Hdw.	134	Lamps.....	27
Machinery.....	61	Lead and Mfrs.	111
Saws and Tools	72	Wooden Ware.	23

## ALL OTHER BRITISH POSSESSIONS.

Scales and Balances.....	\$27
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## The Old and the New.

THE WINDOW of William Mills & Son, 7 Warren street, New York, dealers in Fishing Tackle and Sporting Goods, gives a hint which might be used by merchants in the matter of window arrangement. It contains a striking illustration of extremes in connection with Fishing Rods, bringing out in an effective manner the contrast between the old and the new. One of the Rods, which is a primitive affair, was encountered by one of the firm's patrons while on a recent fishing excursion in an Eastern State. The Rod had evidently been cut and trimmed from a nearby wood. The end was fitted with a brass piece, through which the line could run, while pieces of wire, bent to resemble double-pointed tacks, kept the line close to the pole. A Reel was improvised from a large spool, such as is used for coarse thread, and connected with the Rod by means of two sides and a bottom of thin wood, and fastened with two screws to the Rod. A piece of No. 4 galvanized-iron wire, bent twice, furnished both crank and arbor for the Reel to turn on. The length of pole is 8 feet and the entire weight 19 ounces. A decided contrast is afforded through the medium of a six-section split-bamboo Rod of the latest pattern, consisting of four pieces, including an extra tip. This affair has a cork handle, measures 8 feet and weighs but 2 ounces complete. The firm say it is the lightest Rod that has come under their observation.

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

On business in the general line of Paints and Colors there is hardly anything to note aside from a strictly routine movement for this season of the year, with the experience, perhaps, of more than ordinary economy in purchases by large consumers and jobbers. As not uncommon when business is dull, the more energetic salesmen take some liberties in the matter of regulating net cash prices, and thereby furnish basis for reports of

"cut" prices and weak markets, since those net rates look very low when compared with regular trade rates. There is also a little swaying from the straight and narrow path by principals in some branches of the trade. Altogether the conditions are undoubtedly strained, with various branches of the market betraying signs of yielding more or less to the pressure of general financial uncertainty, and the drawbacks incidental to slow collections at a time when funds are most needed.

*White Lead.*—Deliveries on old orders are only fair; hardly up to the July average, in fact, and in some instances early buyers are having shipments deferred as much as possible in view of the scarcity of funds. Those distributors who have taken up deliveries according to original contract are therefore shown particular favor where new business is involved and the little irregularities in this connection, along with the low cost of crude material, keep the market in somewhat uncertain condition. In point of fact the list of the leading rodgers is more of an ornament than a guide to actual market value. Since it is not jobbers alone that at present adapt their prices, sub rosa, so as to facilitate trade. Cheap varieties of pure Lead and mixed Leads are also irregular, with concessions of  $\frac{1}{2}\%$  off or more from regular lists made on very ordinary orders. In the instance of pure Carbonate, exacting buyers may secure 1-ton lots at the 5-ton quotation and smaller quantities relatively as low.

*Red Lead and Litharge.*—Some orders for good-sized lots of the better grade of Red Lead have been placed, but the orders came from contractors engaged on special lines of iron structural work and reflect no change in the general demand. Other buyers are taking hold in a very indifferent way. Litharge has been very quiet, since large consumers are idle to a great extent and disinclined to anticipate probable future wants. List prices remain as before, but are frequently shaded.

*Orange Mineral.*—There has been a slight weakening in prices of French product, owing to somewhat excessive supply and competition of German brands, more particularly for near future delivery. The irregularity is chiefly on round lots ex ship, but quotations on ordinary jobbing quantities are somewhat uneven. Former quotations for American product are given, but actual selling rates are somewhat different.

*Zincs.*—New business has been moderate. Grinders are receiving on former contracts about enough stock to satisfy present wants, and go slow in the direction of anticipating future requirements in view of the weak condition of the market for crude material. Jobbing movement is hardly up to the average for the season. Former list prices are quoted for both American and foreign brands, but concessions on the same have not been infrequent.

*Colors.*—In bulk goods for grinders' use there has been a moderate trade only, and that was chiefly at prices on a level with the lowest that have ruled previously this month. Dry and Oil Colors for house painters and special uses have found slow sale. There is no radical change in the general surroundings, and hardly any movement in prices has taken place.

*Miscellaneous.*—Black Chalk is unchanged, there being but little movement, while receivers name former prices. Whiting has been slower and the moderate business effected was at practically former prices. Barytes and the general lines of Clays have met

with slow sale, and, while sellers' prices have undergone no radical change, the market shows rather soft tone.

## Oils and Turpentine.

The various branches of the Oil market are practically bare of new feature. Slow sales and light demand are the rule. In a few instances prices have been shaded to some extent, but the movement is nothing more than common softening during a dull season, when counteracting influences carry little force. In the way of really new feature there is nothing to report. Speculative interest is absent, export movement is on a very moderate scale, and home trade buying is on conservative lines of the most pronounced type. There are no signs of any radical changes in the immediate future.

*Linseed Oil.*—City crushers hold their quotation at 50¢ for Raw Oil made from domestic seed, but from that price there is an allowance for the cask, and it is stated also that cash buyers secure other rebates that bring the net cost of the Oil down to or near 48¢. Out-of-town brands are offered at the latter price and have been sold at 47¢, but the competition is not very fierce, and, upon the whole, little advantage is gained when net cost of the city and outside brands is carefully compared. Dealings have been moderate and the demand generally is slow at the present time. In the position of the market for raw material there is some uncertainty, but as yet no sufficient change has taken place to make any radical difference in the cost of Oil, and, all things considered, the market retains remarkably good form.

*Cotton Seed Oil.*—Stagnation has been the prominent feature in the market for this variety of Oils. Some export negotiation has been engaged in, but buyers and sellers keep far enough apart on prices to check business. Home consumers have purchased in an extremely conservative way and speculators have done hardly anything. The little business effected was at former prices, however, indicating quite steady tone in the face of dull trade.

*Lard Oil.*—The market is without change. Pressers find very narrow outlet for their product at the prices asked and the cost of raw material admits of concessions only at the sacrifice of profits. Hence a very unsatisfactory condition of affairs all around. Dealings have been chiefly at prices on the basis of 72¢ @ 73¢ for prime quality city product and best Western brands.

*Fish Oils.*—Reports from the Menhaden fishing note continued light catch of fish and comparatively small accumulation of Oil in first hands. Prices are, therefore, held very stiffly, although the demand is remarkably tame. There has been no change, whatever, in the market for Whale or Sperm Oils, prices holding fairly firm, while business is almost at a standstill.

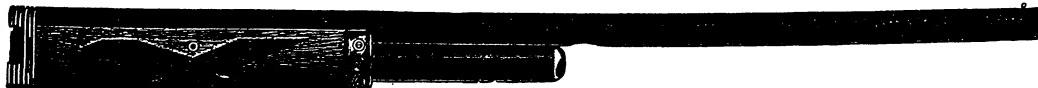
*Miscellaneous.*—Common Olive Oil in barrels has been selling somewhat more freely and at rather better prices, but the movement has a suggestion of speculative maneuver. Ceylon coconut is weak, under the influence of heavy arrivals, and sales have been made at 5¢, or  $\frac{1}{4}\%$  below the popular quotation. Cochin eased off to 6½¢ for ordinary quantities. There has been no change in Tallow, Neat's Foot or Red Oils.

*Spirits Turpentine.*—The demand has not improved to the slightest extent, and while not particularly free, the arrivals have been sufficient to cause some accumulation of stock in first hands. Prices have therefore softened to 27½¢ for machine and 27¾¢ for regular barrels.

**Burgess Repeating Shot Gun.**

Burgess Gun Company, Buffalo, N. Y., are just introducing a 12 gauge repeating shot gun, as illustrated in Figs. 1, 2, 3 and 4. Announcement is also made that as soon as the necessary tools are

the hand, will start open the breech and extract the shell. It is stated that the construction of the gun is such that two quick shots can be fired into the same pattern. The trigger is so arranged that firing can only be accomplished when the breech is closed and locked. Provision has been made

Fig. 1.—*Detached Barrel and Magazine.*

ready, now nearly so, a sporting rifle, repeating automatic pistol and military arms embodying the same principles will be manufactured. Figs. 1 and 2 show the barrel and magazine detached from the stock for convenience in carrying, Fig. 3 the gun ready for use, and

against "hang fires." Double extractors engage each side of the empty cartridge head, and pull evenly and with great strength. Emphasis is laid on the fact that the magazine may remain loaded when the gun is apart with entire safety. It is asserted that double shots may

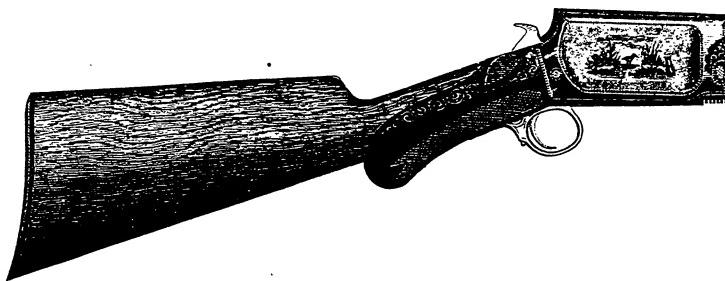
Fig. 2.—*Stock and Trigger Mechanism.*

Fig. 4 the act of ejecting an empty shell. Regarding the action of the gun a distinguishing feature of the movement is a right-hand sliding handle, which is connected to the reciprocating bolt, consisting of a sleeve and pistol grip, which slides on the small of the stock obliquely to the path of movement of the bolt. There is a straight pull bolt and brace similar

be made in one-eighth of a second, and six shots within three seconds. The various features of the gun are referred to minutely in an illustrated pamphlet recently issued by the company.

JAMES A. BOGARDUS, 167 Chambers street, New York, dealer in general

**Ring Chopping Knife.**

E. S. Anderson, Gloversville, N. Y., is offering a ring chopping knife, as here illustrated. It consists of a ring of sheet steel,  $3\frac{1}{2}$  inches in diameter, securely held by two rivets on each side

to tinned metal shanks, being joined at the top with an enameled wood handle, held in position by means of a long rivet. The extreme height is 5 inches. This gives  $10\frac{1}{2}$  inches of chopping edge, which will not clog. It can be quickly cleaned and easily sharpened. This



Chopping Knife.

article is marketed through James A. Bogardus, 167 Chambers street, N. Y., as sales agent.

MATTHAI, INGRAM & Co., Baltimore, Md., have completed a new department for galvanizing and an additional fire-proof building for retinning, which will give them facilities, they advise us, equal to any concern in the

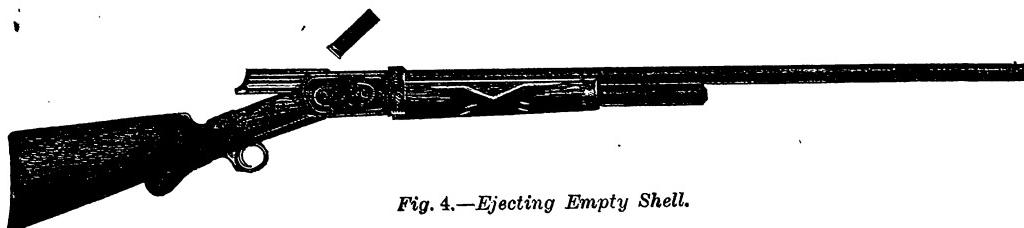
Fig. 3.—*Gun Ready for Use.*

to the Mannlicher, but made stronger, with a handle that fits the hand, which constantly grasps it, requiring no change from the trigger to handle and back, or necessitating the taking of the gun from the shoulder in rapid firing. The trigger finger is always in position in the guard, and a back and forward lifting motion of the right hand operates the

Hardware, is employing a novel method to call attention to the merits of a lawn mower which he is handling. An 18-inch mower with detached handle has been given the center of the show window, while at one side is a colored brother industriously turning a crank that apparently causes the cutter cylinder to revolve. This, however, is not the case, for an electric

country. They will soon occupy the structure built on the site of their fire in March, and expect to add new lines of desirable goods.

BUCK BROS., Millbury, Mass., advise us that their sales for the first six months of 1893 have exceeded those for a similar period in 1892. They refer to the demand for their goods as having

Fig. 4.—*Ejecting Empty Shell.*

gun. In firing deliberately the trigger is only pulled at will. An inertia safety piece is provided by which the shock of discharge unlocks the handle and the counter recoil which gives the body of the gun an impulse forward, when resisted by the natural pull backward of

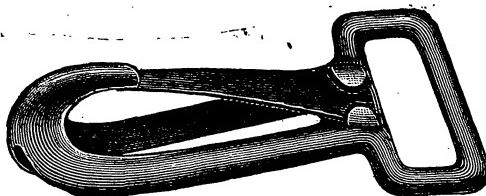
motor has been surreptitiously introduced underneath, connected with an electric light and power circuit and so arranged that the mower keeps the lineal descendant of Ham hard at it, regardless of thermometer or humidity.

been very brisk since January 1, and notwithstanding that they have increased their facilities, the stock of goods on hand is so low that they will continue to manufacture the usual quantity of goods through the summer months.

July 27, 1893.

**Covert's Yankee Loop Snap.**

Covert Mfg. Company, West Troy, N. Y., are putting the above snap on the market, an illustration of it being



Covert's Yankee Loop Snap.

given herewith. It is designed to meet the demand for a cheap, first-class steel spring snap. The snap is referred to as of light, strong and durable construction, and being of XC plate, is of neat appearance.

**New Hand Barrow.**

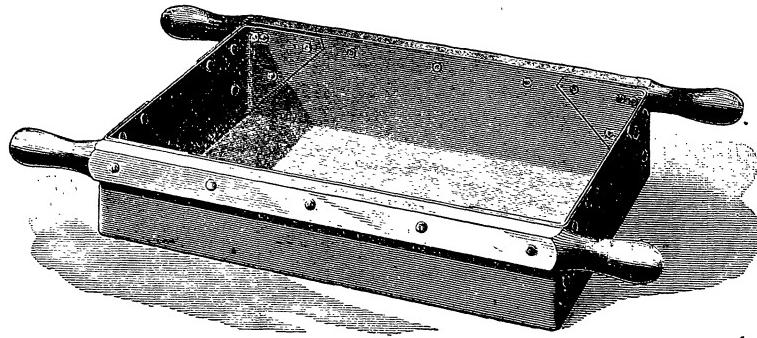
W. J. Clark & Co., Salem, Ohio, are manufacturing a new kind of hand barrow made of sheet steel, an illustration of which is given herewith. The manufacturers claim that the barrow is lighter, more durable and

is increased by attaching a bit to the halter with the company's No. 510 Double Snaps, thus making it is claimed, a safe, convenient and economical open bridle. It is made in two sizes, one for horses of medium or or-

dinary size and the other for the largest horses.

**Trade Publications.**

THE GOULD'S MFG. COMPANY of Seneca Falls, N. Y., have issued a catalogue describing their Duplex water lifters, which have a general application, filling supply tanks in residences, office buildings, &c. They may be employed where the water pressure is insufficient to carry the supply to all points desired or where the supply is impure for pumping other water supply from cisterns or other source. The only

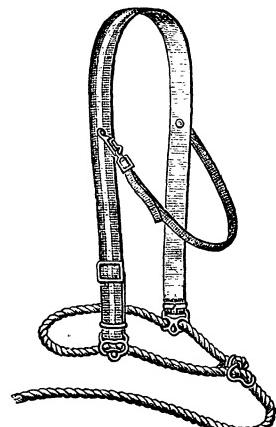


New Hand Barrow.

cheaper than barrows made of wood, and state that for use in shops and factories, where hot metal articles have to be handled, it is especially desirable. They also remark that they are useful and economical in many places where wheelbarrows cannot be used.

**Covert's Combination Adjustable Halter.**

The halter represented herewith is put on the market by the Covert Mfg. Company, West Troy, N. Y. This



Covert's Combination Adjustable Halter.

halter is described as made of superior 18-cord halter web and 7-16 jute rope, and as perfectly adjustable. Its utility

condition precedent to the successful operation of the Duplex water lifter is a pressure of at least 10 pounds per square inch. The lifter is modeled after the Duplex pump, which, as is well known, consists of two steam pumps of equal dimensions placed side by side and each dependent upon the other for its valve movement. The Duplex lifter, having water power cylinders in place of the steam cylinders of the steam pump, consists of two pumps of the same dimensions placed side by side, with the valve motion so designed that the movement of the piston of each pump will control the movement of the slide valve of the opposite pump, the effect of which is to allow one piston to proceed to the end of the stroke and gradually come to rest. During the latter part of this movement the opposite piston moves forward in its stroke, and also gradually comes to rest; but in its movement forward, and before reaching the end of its stroke, the slide valve controlling the first piston is reversed, and in consequence the first piston returns to its original position, and, in nearing the end of its stroke, it in a similar manner reverses the slide valve controlling the second piston. These movements are both uniform and continuous so long as water is supplied to the power cylinders. This form of valve gear enables the lifter to be run at any desired rate of speed. The catalogue gives full particulars as to the amount of water that can be raised to a given height with different working pressures, and the amount of water under pressure needed to raise a given supply.

WE HAVE RECEIVED a pamphlet from the Graham Twist Drill & Chuck Company of Detroit, Mich., in which they describe the advantages of their "grooved" shank drills. The shanks are formed with two oppositely placed triangular grooves, and are adapted to be held in the Graham chucks, the jaws of which are formed to fit the grooves. By this construction all danger of slipping is entirely obviated.

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# Current Hardware Prices.

JULY 26, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10% signifies that the goods in question are sold at prices ranging from discount 50 and 10% to discount 50 and 10 and 5%.

## Adjusters, Blind—

Domestic.....	\$ doz \$8.00	28345
Excelsior.....	\$ doz \$10.00	50&10@50
North's.....	list Oct. @ 10%	

Timmerman's—See Fasteners, Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

Magle Anvils, 4 lb 9oz.....	18@15&5%	
Peter Wright's.....	11@11&5%	
Armitage's Mouse Hole.....	10@11&5%	
Am. Wrought, Horse shoe brand.....	11@11&5%	
Trenton.....	10@10&5%	
Wilkinson's.....	10@11&5%	
Moore & Barnes Mfg. Co. ....	38@10%	

## Anvil Vise and Drill—

Millers Falls Co., \$18.00.....	20%	
Cheney Anvil and Vise.....	25%	
Allen Anvil and Vise \$3.00.....	40@10%	

Star.....

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Common Augers and Bits.....	70@70@10%	
Boring Machine Augers.....	70@70@10%	
Car Bits, 12-in. twist.....	50%	
Emmell Jennings' Augers and Bits 25@10%		
Jennings' Pattern Car Bits.....	40%	
Jennings' Pattern Auger Bits.....	60%	
Snell's Bits.....	60@5%	
C. E. Jennings & Co., No. 10, extension tip.....	40%	
C. E. Jennings & Co., No. 30.....	60%	
C. E. Jennings & Co., Auger Bits, 5 set, 324 quarters, No. 5, \$5; No. 30, \$3.50@5%		
Lewis' Patent Single twist.....	45%	
Pugh's Black.....	20%	
Pugh's Jennings Pattern.....	30%	
L'Hommedieu Car Bits.....	15@10%	
Worster Pat. Auger Bits.....	15%	
Cincinnati Bell-Hangers' Bits.....	30@10%	

## Bit Stock Drills—

Horse Twist Drills.....	50@10@5%	
Standard.....	50@10@5%	
Cleveland.....	50@10@5%	
Syracuse, for metal.....	50@10@5%	
Syracuse, for wood (wood list).....	30@80@5%	
Cincinnati, for wood.....	30@10@5%	
Cincinnati, for metal.....	45@10%	

## Expansive Bits—

Ives' small, \$18; large, \$26.....	35@35@10%	
Ives' No. 4, \$ doz \$60.....	40%	
Evan's.....	40%	
Steers', No. 1, \$26; No. 2, \$18.....	35@40%	
Stearns' No. 2, \$48.....	20%	

## Gimlet Bits—

Common.....	\$ gross \$2.75@\$3.25	
Diamond.....	\$ doz \$1.25.....	40%
See.....	25@25@5%	
Double Cut, Shepardson's.....	.45@45@5%	
Double Cut, Ct. Valley Mfg. Co. ....	30@10@5%	

Double Cut, Hartwell's.....

\* gross, \$10.00.....

Double Cut, Douglass'.....

Double Cut, Ives'.....

60@60@10%

## Hollow Augers—

Ives'.....	\$ doz \$1.00@33%	
French, Swift & Co. (Beecher) {	\$10%	
Douglass'.....		
Bonney's Adjustable, \$ doz \$48.....	50%	
Stearns'.....	20@10@5%	
Ives' Expansive, each \$4.50.....	50@5%	
Universal Expansive, each \$4.50.....	20%	
Wood's.....	25@25@10%	
Cincinnati Adjustable.....	25@10@5%	
Cincinnati Standard.....	25@10@5%	

## Ship Augers and Bits—

L'Hommedieu's.....	15@10@15@10@5%	
Watrous'.....	25@25@10%	
Snell's.....	25@25@10%	
Snell's Ship Auger Patt'n Car Bits, 15@10@15@10@5%		

## Awl Hafts—See Hafts, Awl.

## Awls—

Awls, Sewing, Common.....	* gr. 85@90@	
Awls, Should. Peg.....	* gr. 85@90@55	
Awls, Pat. Peg.....	* gr. 85@90@33	
Awls, Shouldered Brad. *	* gr. 81@90@140	
Awls, Shouldered Brad. *	* gr. \$2.50@\$3.00	
Awls, Handled Scratch. *	* gr. \$4.00@4.50	
Awls, Socket Scratch. *	doz. \$1.10@\$1.20	

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

Plain, Beveled, First quality, best brands.....	\$7.00	\$7.50
First qual., other brands {	6.50	7.00
Second quality.....	5.50	6.00

## Axle Grease—See Grease, Axle.

## Axes—

No. 1.....	34@44@No. 2, 5@6@	
No. 7 to 12.....	60@6@10%	
No. 15 to 18.....	47@5@6@	3% cash
No. 19 to 22.....	70@5@6@	
Concord Axles, loose collar.....	44@4@6@	
Concord Axles, solid collar.....	54@4@6@	
Nations' Tubular Self Oiling.....	88@4@8@	

## Bag Holders—See Holders, Bag.

## Balances—

Spring Balances.....	40%	
Chatillon, No. 2000.....	20 30	
Chatillon, 30 oz. 0.80 0.95 1.75 net		
Chatillon Circular Balances.....	50@10%	

## Barb Wire—See Wire, Barb.

## Bars—

Cast Steel.....	* D 31@	
Iron, Steel Points.....	* D 34	

## Basins, Wash—

Standard Fiberware, No. 1, 104-in., \$1.80; 12-inch, \$2.00; 134-inch, \$2.50; 15-inch, \$3.00.		
Chatillon's No. 1.....	40%	

## Beams, Scale—

Scale Beams, List Jan. 12, '82. .50@10@		
Custer's.....	50@10@5%	

## Beaters—

Dover.....	* doz \$1.00@1.20	
Duplex (Standard Co.).....	* doz \$1.00	
Dover (Standard Co.).....	* doz \$1.00	

## Beads—

Beads—Egg—	* gross \$14.00	
Bryant's.....	* gross \$14.00	
Double (H. & R. Mfg. Co.).....	* gross \$14.00	

## Beads—Crow—

Cast Steel.....	* D 31@	
Iron, Steel Points.....	* D 34	

## Basins, Wash—

Common Fibreware, No. 1, 104-in., \$1.80; 12-inch, \$2.00; 134-inch, \$2.50; 15-inch, \$3.00.		
Chatillon's No. 1.....	40%	
Custer's.....	33@34	

## Beats—

Dover.....	* gross \$14.00	
Duplex (Standard Co.).....	* gross \$14.00	
Dover (Standard Co.).....	* gross \$14.00	

## Beats—Cow—

Common Wrought.....	60@10@5%	
Western, Sargent's list.....	70@10@5%	
Kentucky, "Star".....	70@10@5%	

## Beats—Kentucky—

Kentucky, Sargent's list.....	70@10@5%	
Kentucky Durham.....	70@10@5%	
Dodge, Genuine Kentucky.....	70@10@5%	

## Belts—Door—

Gong, Abbe's.....	* D 31@10%	
Gong, Yankee.....	* D 31@10%	
Gong, Barton's.....	* D 31@10@5%	

## Belts—Crank—

Crank, Brooks'.....	* gross \$1.00	
Crank, Connel's.....	* gross \$1.00	





Brittan, Graham & Mathes, list Jan. 1890.....	60@10&10%
Plate.....	\$34@2%
Barnes Mfg. Co. ....	40@40&10%
Yarn.....	.net prices
Delta Flat Key.....	94%
Bommer's Night Latches.....	15%
Brooklyn Latches.....	50@10%
Warner's Burglar Proof. # doz. \$8.00, 50%	
Elevator -	
Moore's.....	39@4%
'Padlocks -	
List June 10, 1891.....	50@2%
Norwich Lock Mfg. Co., old list.....	50@2%
Yale Lock Mfg. Co.'s.....	net prices
Eagle.....	40%
Eureka, Eagle Lock Co. ....	40@2%
Romer's Nos. 0 to 91.....	30%
Romer's Scandinavian, &c., Nos. 100 to 505.....	15%
A. E. Deitz.....	40%
Champion Padlocks.....	40%
Hotchkiss.....	30%
Star.....	60%
Horseshoe.....	# doz. \$9.50@50@10%
Barnes Mfg. Co. ....	40@40&10%
Noek's.....	30%
Scandinavian.....	90@40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....	90@10%
Other Nos. ....	65%
Ames Sword Co. up to No. 150.....	40%
Ames Sword Co., above No. 150.....	50%
Slaymaker, Barry & Co. No. 1010 line.....	90@5%
No. 41 line.....	50%
No. 61 line.....	60%
No. 21 line.....	80%
Sash, &c. -	
Clark's No. 1, \$10; No. 2, \$8 # gr. ....	33@4%
Jackson's.....	39@4%
Victor.....	60@10@2%
Walker's.....	10%
Attwell Mfg. Co. ....	25@33@4%
Reading.....	60@10@66@4% & 10@10%
Hammond's Window Springs.....	40%
Common Sense, Jap'd., Cop'd. and Br'd. ....	# gr \$4.00
Common Sense, Nickel Plated.....	
Universal.....	30%
Kempshall's Gravity.....	60%
Kempshall's Model.....	60@60@10%
Corbin's Daisy, list Feb. 15, 1888.....	70%
Fayson's Perfect.....	60@10@10%
Eggenin's Safe Balances.....	25@5@2%
Eggenin's New Safe Locks.....	25@5@2%
Ives Patent.....	60@10@5@60@10@10%
Fish (Liesche's pat.), No. 100, # gr. \$8; No. 105, # gr. \$10.	
Davis, Bronze, Barnes Mfg. Co. ....	60%
Champion Safety list January, 1893. 70@5%	
Security.....	70%
Giant, list Jan. 1892.....	70@5%
Wolcott's.....	60@10@5%
Monarch.....	50%
Lumber Tools -	
See Tools, Lumber.	
Lustro -	
Four-ounce bottles.....	# doz. \$1.75; # gross. \$17.00
Machines.	
Boring -	
Without Angers. Upright, Angular. Douglas.....	\$5.50 \$8.75; .50%
Snell's, Rice's Pat. ....	5.50 6.75-10.50@10@10%
Jennings'.....	5.50 6.75-15@45@5@10%
Other Machines. 2.35 2.75.....	
Phillips' Patent with Angles. 7.00 7.50.....	
Miller's Falls....	7.50 .....
Boss, Carpenters' 3.60	
Boss, Ship Builders' 3.85	
Fluting -	
Knox, 4½-inch Rolls.....	33.25 each } 35%
Knox, 6-inch Rolls.....	33.60 each }
Eagle, 3½-inch Rolls. \$2.15.....	35%
Eagle, 5½-inch Rolls. \$2.85.....	35%
Crown, 4½ in. \$8.50; 6 in. \$4.00; 8 in. \$6.50 each.....	35%
Crown Jewel, 6 in. ....	\$8.50 each, 35%
American, 5 in. \$3.00; 6 in. \$3.40; 7 in. \$4.50 each.....	35%
Domestic Fluter. ....	each, \$1.50
Geneva Hand Fluter, White Metal. ....	\$ doz. 12, 25%
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....	30%
Shepard Hand Fluter, No. 85, per doz \$15.50.....	40%
Shepard Hand Fluter, No. 110, # doz \$11.00.....	40%
Shepard Hand Fluter, No. 95, # doz \$8.00.....	40%
Combined Fluter and Sad Iron. # doz \$15.00.....	80%
Holisting -	
Moore's Hand Holist, with Look Brake. 20%	
Moore's Anti-Friction Differential Pulley Block.....	20%
Moore's Rope Differential Pulley Block.....	60%
Energy Mfg. Co.'s.....	25%
See also Blocks.	
Washing -	
Anthony Wayne, # doz. No. 1, \$42; No. 2, \$36; No. 3, \$42.	
Wayne American.....	# doz \$38.00
Western Star # doz. No. 2, \$38; No. 3 \$30.	
Weissell.....	# doz \$54.00
Fair and Square.....	# doz \$42.00
Mallets -	
Hickory.....	20@10@20@10@10%
Lignumvite's.....	20@10@20@10@10%
B. & L. Block Co., Hickory & L. V. 30@30@10	
Mattocks - Regular list. 80@10@60@10@5%	
Measures -	
Standard Fiberware, No. 1, peck # dozen, \$6.50; ½ peck, \$8.00	
Meat Cutters -	
See Cutters, Meat.	
Menders, Harness -	
Per doz.....	\$2.00
Milk Cans - See Cans, Milk.	
Mills -	
Coffee -	
Box and Side, List Jan. 1, 1888. # doz @ 60@5%	
Net prices are often made which are lower than above discount.	
American, Enterprise Mfg. Co., list Jan. 17, 1893.....	20%
The Swift, Lane Bros. ....	30%
Waddel's New Box Mills, Ideal Brand, New List.....	60%
Plates -	
Padlocks -	
List June 10, 1891.....	50@2%
Norwich Lock Mfg. Co., old list.....	50@2%
Yale Lock Mfg. Co.'s.....	net prices
Eagle.....	40%
Eureka, Eagle Lock Co. ....	40@2%
Romer's Nos. 0 to 91.....	30%
Romer's Scandinavian, &c., Nos. 100 to 505.....	15%
A. E. Deitz.....	40%
Champion Padlocks.....	40%
Hotchkiss.....	30%
Star.....	60%
Horseshoe.....	# doz. \$9.50@50@10%
Barnes Mfg. Co. ....	40@40&10%
Noek's.....	30%
Scandinavian.....	90@40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....	90@10%
Other Nos. ....	65%
Ames Sword Co. up to No. 150.....	40%
Ames Sword Co., above No. 150.....	50%
Slaymaker, Barry & Co. No. 1010 line.....	90@5%
No. 41 line.....	50%
No. 61 line.....	60%
No. 21 line.....	80%
Nails -	
Cut and Wire. See Trade Report.	
Wire Nails, Papered.	
Molasses Gates -	
See Gates, Molasses.	
Money Drawers -	
See Drawers, Money.	
Mowers, Lawn -	
Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16-in., \$5.50; 18-in., \$6.	
Low-Grade Machines: 10-in. \$3; 12-in., \$3.25 14-in., \$3.50 each	
Muzzles -	
Safety.....	# doz. \$3.00, 25%
Nails -	
Cut and Wire. See Trade Report.	
Wire Nails, Papered.	
Association list, May 1, '92. 80@10@10@5%	
Tack Mfrs.' list.....	70@&70@10@
Hungarian, Finishing, Upholsterers', &c. See Tacks.	
Horse -	
Nos. 6 7 8 9 10	
American.....	9½ 9½ 9½ 9½ 9½ .....
Ausable.....	23½ 26½ 25½ 24½ 23½ .....
Clinton, Fin. 19½ 17½ 16½ 15½ 14½ .....	30@5@5%
Essex.....	23½ 26½ 25½ 24½ 23½ .....
Lyra.....	9½ 9½ 9½ 9½ 9½ .....
Snowden.....	9½ 9½ 9½ 9½ 9½ .....
Vulcan.....	23½ 21½ 20½ 19½ 18½ .....
Northwest' 23½ 23½ 22½ 21½ 20½ .....	25@25@5%
A. C. ....	25@23@22½ 21½ 21½ .....
C. B. K. ....	25@23@22½ 21½ 21½ .....
Maud S. ....	25@23@22½ 21½ 21½ .....
Champlain 23½ 26½ 25½ 24½ 23½ .....	40@10@5%
Champion.....	25@23@22½ 21½ 20½ .....
Capewell.....	19½ 18½ 17½ 16½ 16½ .....
Anchor.....	23½ 21½ 20½ 19½ 18½ .....
Western.....	23½ 21½ 20½ 19½ 18½ .....
Empire Bronzed.....	18@14 # D
Picture -	
Brass Head, Sargent's list. ....	60@60@10@
Brass Head, Combination list. ....	50@10@10@
Porcelain Head, Sargent's list. ....	50@60@10@
Porcelain Head, Combination list. 40@10@10@	
Niles' Patent. ....	40%
Nail Pullers -	See Pullers, Nail.
Nail Sets -	See Sets, Nail.
Nut Crackers -	
See Crackers, Nut.	
Nuts -	List Dec. 18, 1889.
Square, Hex.	
Hot Pressed.....	5.80# 6.50# off list
Cold Pressed.....	5.00# 6.10# off list
In packages of 100 lb, add 1-10# # D net; in packages less than 100 lb, add ½ # D, net.	
Oakum -	
Best or Government. ....	# doz. 63@71@4
U. S. Navy.....	# doz. 52@6@6@
Navy.....	# doz. 52@6@6@
Oil Tanks -	See Tanks, Oil.
Oilers -	
Zinc and Tin. ....	65@10@70@5%
Brass and Copper. ....	50@10@50@10@5%
Malleable Hammers' Improved. No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 # doz.	
10@10@5%	
Malleable, Hammers' Old Pattern, same list. ....	25@
Pickums -	
Faber's Carpenters'. ....	high list 50%
Faber's Round Gilt. ....	# gro. 25.50
Dixon's Lead. ....	# gro. 4.50
Dixon's Lumber. ....	# gro. 6.75
Dixon's Carpenters'. ....	.10%
Pencils, Soapstone -	
See Crayons.	
Pickers, Fruit -	
Prize Fruit Pickers. ....	.50%
Picks -	
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00. ....	60@10@60@10@5%
Black Flag. ....	5 and 10 lb pails, # doz. 7@8
Black Flag, liquid, in bottles, # gro. \$8.00	
Diamond Rock Nickel Cleaner. ....	# gro. \$10.00
Raven Liquid, 6 oz. bottles. ....	# gal. \$0.80 70 .60 .50
Raven Liquid, 8 oz. bottles. ....	# gro. \$8.00
Raven Water Polish, large boxes. ....	# gro. \$9.00
Raven Paste in 5 lb. pails (cases of 6 pails), # D 10@	
Poppers, Corn -	
Round or Square, 1 qt. ....	# doz. 1.00; # gro. \$8.00
1½ qt. ....	# doz. 1.00; # gro. \$9.00
2 qt. ....	# doz. 1.50; # gro. \$14.00
Post Hole and Tree Augers and Diggers -	
See Diggers, Post Hole, &c.	
Potato Parers -	
See Parers, Potato.	
Pots -	
Glue -	
Tinned. ....	40@10@40@10@5%
Enameled. ....	40@10@40@10@5%
Family, Howe's "Eureka". ....	.50%
Family, L. F. C.'s "Handy". ....	.50%
Powder -	
In Canisters -	
Fine Sporting, 1 lb each. ....	0.90
Duck, 1 lb each. ....	.60
Rifle, 1 lb each. ....	.38
Rifle, ½ lb each. ....	.18
In Kegs -	
Rifle, 2½ lb kegs. ....	\$3.50
Rifle, 12½ lb kegs. ....	2.00
Rifle, 6½ lb kegs. ....	1.15
Duck, 25 lb kegs. ....	11.00
Duck, 12½ lb kegs. ....	5.75
Duck, 6½ lb kegs. ....	3.00
Presses -	
Fruit and Jelly -	
Enterprise Mfg. Co. ....	.25@
Kenis. ....	.25@
Shepard's, Queen City. ....	.25@
Silver & Co. ....	.25@
Pruning Hooks and Shears -	See Shears.



**Snaps, Harness, &c.-**

Anchor (T. & S. Mfg Co.)	58¢
Fitch's (Bristol)	50¢ & 10¢
Hochkiss	10¢
Andrews	50¢
Sargent's Patent Guarded	70¢ & 10¢
German, new list	40¢ & 10¢
Covert	50¢ & 10¢ & 25¢
Covert, New Patent	50¢ & 10¢ & 25¢
Covert, New R. E.	60¢ & 10¢ & 25¢
Covered Spring	60¢ & 10¢ & 10¢
Covert's Saddlery Works' Triumph	33¢ & 5¢
John Prots Snaps	75¢ & 75¢ & 5¢
Kelley & Woolworth's Steel Harness	60¢ & 10¢ @ 60¢

**Snaths-**

See Irons, Soldering.

**Spltoons, Cupidors, &c.-****Standard Fiberware-**

Cupidors, 8½-inch, ¾ doz., No. 5, \$8; No. 62, \$9.

Spltoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, \$6.

**Spoke Shaves-**

See Shaves, Spoke.

**Spoke Trimmers-**

See Trimmers, Spoke.

**Spoons and Forks-****Tinned Iron-**

Basting, Cen. Stamp. Co.'s list....70¢ & 10¢  
Solid Table and Tea, Cen. Stamp. Co.'s list....70¢ & 10¢

Buffalo, S. S. & Co....33¢ & 25¢

**Silver Plated-**

4 months or 55 cash 30 days:	
Meriden Brit. Co., Rogers	40¢ & 15¢
C. Rogers & Bros.	40¢ & 15¢
Rogers & Bros.	40¢ & 15¢
Reed & Barton.	40¢ & 10¢ & 5¢
Wm. Rogers Mfg. Co.	40¢ & 15¢ & 5¢
Simpson, Hall, Miller & Co.	40¢ & 15¢ & 5¢
Holmes & Edwards Silver Co.	40¢ & 15¢ & 5¢
L. Boardman & Son.	50¢ & 12½¢

**Miscellaneous-**

Holmes & Edwards Silver Co.:  
No. 67 Mexican Silver....50¢ & 10¢ & 5¢

No. 30 Silver Metal....50¢ & 10¢ & 5¢  
No. 24 German Silver....50¢ & 10¢ & 5¢

No. 50 Nickel Silver....50¢ & 10¢ & 5¢

No. 49 Nickel Silver....50¢ & 10¢ & 5¢

Wm. Rogers Mfg. Co.:  
Rogers' Silver Metal....50¢ & 10¢ & 5¢

15¢ Rogers' German Silver....90¢ & 10¢

25¢ Rogers' Nickel Silver....50¢ & 10¢ & 5¢

German Silver....50¢ & 10¢ & 5¢

German Silver, Hall & Elton....50¢ & 50¢ cash

Nickel Silver....50¢ & 50¢ & 10¢ & 5¢ cash

Britannia....50¢ & 50¢ & 10¢ & 5¢

Boardman's Nickel Silver, list July 1, 1891....60¢ & 7½¢ & 5¢

Boardman's Britannia Spoons, case lots....60¢ & 5¢ cash

Springs—Door—

Torrey's Rod, 39 in....\$ doz \$1.20 @ 12  
Warner's No. 1, ¾ doz \$1.50; No. 2, \$3.40;

55¢ & 55¢ & 10¢

Gem (Coll.), list April 19, 1886....20¢

Star (Coll.), list April 19, 1886....20¢ & 10¢

Victor (Coll.)....60¢ & 10¢ & 10¢ & 5¢

Champion (Coll.)....60¢ & 10¢ & 10¢ & 5¢

Gowell's, No. 1, ¾ doz \$18.00; No. 2, \$15.00;

50¢ & 50¢ & 10¢

Bubber, complete, ¾ doz \$4.50....55¢ & 10¢

Hercules....50¢ & 50¢ & 10¢

Phoenix....33¢ & 5¢

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half

Scroll....60¢ & 10¢ & 8¢ & 10¢ & 10¢ or net prices

Cliff's Bolster Springs....25¢

Squares—

Steel and Iron....\$ .80 & 10¢ & 10¢ @ 80¢ & 25¢

Nickel-Plated....\$ .80 & 10¢ & 10¢ @ 80¢ & 25¢

Try Square and T Bevels....60¢ & 10¢ & 10¢

Diston's Try Square and T Bevels....50¢

Winterbottom's Try and Miter....30¢ & 10¢

Starrett's Micrometer Caliper Squares....25¢

Avery's Flush Bevel Squares....40¢

Avery's Bevel Protractor....50¢

Squeezers—Fodder—

Blair's....\$ doz \$2.00

Blair's "Climax"....\$ doz \$1.25

Lemon—

Porcelain Lined, No. 1....\$ doz \$6.00

25¢ & 30¢

Wood, No. 2....\$ doz \$3.00, 35¢

Wood, Common....\$ doz \$1.70 @ 1.75

Dunlap's Improved....\$ doz \$3.75, 20¢

\$18 ¾ doz....25¢ & 10¢

Jennings' Star....\$ doz \$2.50

The Boss....\$ doz \$2.50

Dean's, Nos. 1, ¾ doz \$6.50; 2, \$3.35; 3,

\$1.00; Queen, \$2.50

Little Giant....50¢ & 50¢ & 10¢

King....40¢ & 5¢

Hotchkiss Straight Flash....\$ doz \$12.00

Silver & Co., Glass....\$ gro. 29.00

Standard Fiber Ware—

See Ware, Standard Fiber.

Staples—

Barbed Blind, ½ in. and larger, ¾ 17¢ & 7½¢

Barbed Blind, ¼ in....¾ 8¢ & 8½¢

Fence Staples, Galvanized, Same price

Fence Staples Plain....as Frb Wire

See Frd Rep.

Grand Crossing Tack Co.'s list....75¢ & 10¢

Steelyards....40¢ & 10¢ & 50¢

Stocks and Dies—

Blacksmith's:

Waterford Goods....\$5¢

Butterfield's Goods....\$5¢

Lightning Screw Plate....25¢ & 30¢

Eccles' New Screw Plates....25¢ & 30¢

Reversible Ratchet....30¢

Gardner....25¢

Green River....\$5¢ & 30¢

Stops, Bench—

McMill's, ¾ doz. No. 1, \$10.00; No. 2, \$11.00

40¢ & 50¢

Hotchkiss'....\$ doz \$5, 10¢ & 10¢

Weston's, No. 1, ¾ doz. \$5, \$10, \$12 & \$15

McMill's, ¾ doz. \$5, \$10, \$12 & \$15

Claw Handle Carpet....\$ gross \$4.00

Bonnie Blue....\$ box 1.50

Miscellaneous—

Double Point....90¢ & 92¢ & 10¢

Wire Carpet Nails....\$50¢ & 52¢

Picture-Frame Points, S. S....\$5¢

Finishing Nails....60¢

Trunk and Clout Nails—

Black....\$5¢

Tinned or Coppered....67¢ & 72¢

Basket Nails....60¢

Chair Nails....52¢ & 55¢

Cigar Box Nails....50¢

Tin-Capped Nails....50¢

Extra discount 25¢ & 28¢

**McGill's, ¾ doz \$8....10**

Cincinnati....25¢ & 30¢

Terrell's Nos. 1 and 2, ¾ doz. \$8; No. 3, \$3.60....80¢

Millers Falls....25¢

Stearns'....20¢ & 25¢

Stone—

**Stones, Grind—See Grindstones.****Scythe Stones—**

Pike Mfg. Co., list April, 1892....\$3.45

Cleveland Stone Co., list Nov. 1892....\$3.45

**Oil Stones, &c.—**

Pike Mfg. Co.

Hinckley No. 1, ¾ doz. \$8....80¢

Sand Stone....\$ doz \$5....10¢

Turkey Oil Stone, 4 to 8 in....40¢ & 40¢ & 50¢

in....\$ doz \$8....10¢

Turkey Slips....\$ doz \$2.00

Lily White Washita....60¢

Rosy Red Washita....60¢

Washita Stone, Extra....60¢

Washita Stone, No. 2....40¢

Washita Stone, No. 1, 3 to 5 in....\$ doz \$8....10¢

Arkansas Stone, No. 1, 3 to 5 in....\$ doz \$8....10¢

Arkansas Stone, No. 1 ½ to 8 in....\$ doz \$8....10¢

Lake Superior....\$ doz \$13....18¢

Lake Superior Slips....\$ doz \$10¢

Stove Polish—

**Stretcher Carpet—**

Cast Steel, Polished....\$ doz \$2.2

Cast Iron, Steel Points....\$ doz \$2.00 & 80¢

Socket....\$ doz \$1.75

Bullard's....25¢ & 25¢ & 10¢

**Straps, Razor—**

Genuine Emerson....60¢ & 60¢ & 5¢

Imitation "....\$ doz \$2.00, 20¢ & 10¢ & 5¢

Torrey's....\$ doz \$2.00, 20¢ & 10¢ & 5¢

Badger's Belt and Com....\$ doz \$2.00

Lamont Combination....\$ doz \$4.00

Jordan's Pat. Padded, list Nov. 1, '89....\$5.00

Electric Cutlery Co....Net

Campbell Cutlery Co....Net

**Stuffer, Razor—**

Miles' Challenge....\$ doz \$2.00, 50¢ & 5¢

Perry....\$ doz \$2.00, \$15.00; No. 0, \$2.00, \$15.00; No. 1, \$2.00, \$15.00; No. 2, \$2.00, \$15.00; No. 3, \$2.00, \$15.00; No. 4, \$2.00, \$15.00; No. 5, \$2.00, \$15.00; No. 6, \$2.00, \$15.00; No. 7, \$2.00, \$15.00; No. 8, \$2.00, \$15.00; No. 9, \$2.00, \$15.00; No. 10, \$2.00, \$15.00; No. 11, \$2.00, \$15.00; No. 12, \$2.00, \$15.00; No. 13, \$2.00, \$15.00; No. 14, \$2.00, \$15.00; No. 15, \$2.00, \$15.00; No. 16, \$2.00, \$15.00; No. 17, \$2.00, \$15.00; No. 18, \$2.00, \$15.00; No. 19, \$2.00, \$15.00; No. 20, \$2.00, \$15.00; No. 21, \$2.00, \$15.00; No. 22, \$2.00, \$15.00; No. 23, \$2.00, \$15.00; No. 24, \$2.00, \$15.00; No. 25, \$2.00, \$15.00; No. 26, \$2.00, \$15.00; No. 27, \$2.00, \$15.00; No. 28, \$2.00, \$15.00; No. 29, \$2.00, \$15.00; No. 30, \$2.00, \$15.00; No. 31, \$2.00, \$15.00; No. 32, \$2.00, \$15.00; No. 33, \$2.00, \$15.00; No. 34, \$2.00, \$15.00; No. 35, \$2.00, \$15.00; No. 36, \$2.00, \$15.00; No. 37, \$2.00, \$15.00; No. 38, \$2.00, \$15.00; No. 39, \$2.00, \$15.00; No. 40, \$2.00, \$15.00; No. 41, \$2.00, \$15.00; No. 42, \$2.00, \$15.00; No. 43, \$2.00, \$15.00; No. 44, \$2.00, \$15.00; No. 45, \$2.00, \$15.00; No. 46, \$2.00, \$15.00; No. 47, \$2.00, \$15.00; No. 48, \$2.00, \$15.00; No. 49, \$2.00, \$15.00; No. 50, \$2.00, \$15.00; No. 51, \$2.00, \$15.00; No. 52, \$2.00, \$15.00; No. 53, \$2.00, \$15.00; No. 54, \$2.00, \$15.00; No. 55, \$2.00, \$15.00; No. 56, \$2.00, \$15.00; No. 57, \$2.00, \$15.00; No. 58, \$2.00, \$15.00; No. 59, \$2.00, \$15.00; No. 60, \$2.00, \$15.00; No. 61, \$2.00, \$15.00; No. 62, \$2.00, \$15.00; No. 63, \$2.00, \$15.00; No. 64, \$2.00, \$15.00; No. 65, \$2.00, \$15.00; No. 66, \$2.00, \$15.00; No. 67, \$2.00, \$15.00; No. 68, \$2.00, \$15.00; No. 69, \$2.00, \$15.00; No. 70, \$2.00, \$15.00; No. 71, \$2.00, \$15.00; No. 72, \$2.00, \$15.00; No. 73, \$2.00, \$15.00; No. 74, \$2.00, \$15.00; No. 75, \$2.00, \$15.00; No. 76, \$2.00, \$15.00; No. 77, \$2.00, \$15.00; No. 78, \$2.00, \$15.00; No. 79, \$2.00, \$15.00; No. 80, \$2.00, \$15.00; No. 81, \$2.00, \$15.00; No. 82, \$2.00, \$15.00; No. 83, \$2.00, \$15.00; No. 84, \$2.00, \$15.00; No. 85, \$2.00, \$15.00; No. 86, \$2.00, \$15.00; No. 87, \$2.00, \$15.00; No. 88, \$2.00, \$15.00; No. 89, \$2.00, \$15.00; No. 90, \$2.00, \$15.00; No. 91, \$2.00, \$15.00; No. 92, \$2.00, \$15.00; No. 93, \$2.00, \$15.00; No. 94, \$2.00, \$15.00; No. 95, \$2.00, \$15.00; No. 96, \$2.00, \$15.00; No. 97, \$2.00, \$15.00; No. 98, \$2.00, \$15.00; No. 99, \$2.00, \$15.00; No. 100, \$2.00, \$15.00; No. 101, \$2.00, \$15.00; No. 102, \$2.00, \$15.00; No. 103, \$2.00, \$15.00; No. 104, \$2.00, \$15.00; No. 105, \$2.00, \$15.00; No. 106, \$2.00, \$15.00;

**Whips**

American Whip Co.: Length.	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8 ft.
X. L. Whalebone Driving...	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Murk's, Two-thirds Whalebone.	15.00	16.50	18.00	20.00	....	....	....	....
Bull Bone, Half-length Whalebone.	11.00	12.00	13.00	15.00	....	....	....	....
American Standard.	8.00	8.50	8.50	10.50	12.00	12.50	15.00	16.50
True Grip, Raw Hide Center.	6.00	6.00	6.50	7.00	7.50	8.00	....	....
New Name Stocked Java, Black and Wine Colors.	....	....	6.00	....	....	....	....	....
Ameritus, 83 Pen Whip.	....	....	6.00	....	....	....	....	....
Gents' Light Driving No. 111.	....	....	6.00	....	....	....	....	....
Gents' Light Driving No. 106.	....	....	5.00	....	....	....	....	....
Hand-made Stocked Java No. 109.	....	....	8.75	4.00	....	....	....	....
A large variety of cheaper grades.	....	....	....	....	50¢ <sup>40</sup> to \$3.00	....	....	....
Team Whips.	....	....	....	....	....	50¢ <sup>40</sup> to \$7.50	....	....
Toy Whips.	....	....	....	....	....	....	....	....
Hardware Assortment, 10/American, 76 Whips for \$60.00.	....	....	....	....	....	....	....	....

Per dozen.

**Wire and Wire Goods—****Iron—**

Market,	Stone,	Br. and Ann'd.	80¢ <sup>40</sup>	Extra 10%
Br. & Ann. Nos. 0 to 18.	Nos. 16 to 18.	....	....	....
70¢ <sup>40</sup> to 75¢ <sup>40</sup> to 10¢ <sup>40</sup>	Nos. 19 to 26.	80¢ <sup>40</sup>	....	....
Cop'd., Nos. 0 to 18.	Nos. 27 to 36.	82¢ <sup>40</sup>	....	....
Galv., Nos. 0 to 18.	Tinned Broom Wire, 18 to 21.	12¢ <sup>40</sup>	12¢ <sup>40</sup>	12¢ <sup>40</sup>
70¢ <sup>40</sup> to 70¢ <sup>40</sup> to 10% <sup>40</sup>	Galvanized Fence.	75¢ <sup>40</sup>	75¢ <sup>40</sup>	75¢ <sup>40</sup>
Tin'd., Tin'd. list. Nos. 0 to 18.	Brass, list Jan. 18, 1884.	40¢ <sup>40</sup>	40¢ <sup>40</sup>	40¢ <sup>40</sup>
....	Cop'd., list Jan. 18, 1884.	40¢ <sup>40</sup>	40¢ <sup>40</sup>	40¢ <sup>40</sup>
....	Annealed Wire on Spools.	60¢ <sup>40</sup>	60¢ <sup>40</sup>	60¢ <sup>40</sup>
....	Malin's An'aled & Tin'd. on Spools.	60¢ <sup>40</sup>	60¢ <sup>40</sup>	60¢ <sup>40</sup>
....	Malin's Brass and Cop. on Spools.	50¢ <sup>40</sup>	50¢ <sup>40</sup>	50¢ <sup>40</sup>
....	Ossawan Mills, An'led and Tinned on Spools.	60¢ <sup>40</sup>	60¢ <sup>40</sup>	60¢ <sup>40</sup>

Ossawan Mills, Brass and Copper on Spools.	Bemis & Call's:
Spools.	Pat. Combination Bright.
50¢ <sup>40</sup> to 10%	40¢ <sup>40</sup> to 10%
Tin'd. Spooled.	Pat. Combination Black.
50¢ <sup>40</sup> to 10%	40¢ <sup>40</sup> to 10%
Tate's Spooled Cop. and Brass.	Merrick's Pattern.
50¢ <sup>40</sup>	45¢ <sup>40</sup>
Cast Steel Wire.	Brigg's Pattern.
50¢ <sup>40</sup>	50¢ <sup>40</sup>
Stubs Steel Wire.	Cylinder or Gas Pipe.
50¢ <sup>40</sup> to 2¢ <sup>40</sup> , 30%	45¢ <sup>40</sup>
Steel Music Wire, 18 to 30, Imported.	No. 3 Pipe.
....	55¢ <sup>40</sup>
Wire Clothes Line, see Lines.	Aiken's Pocket (Bright).
Wire Picture Cord, see Cord.	36¢ <sup>40</sup> to 10%
....	The Favorite Pocket.
....	40¢ <sup>40</sup> to 10%
Bright Wire Goods—	Webster's Pat. Combination.
Standard list.	35¢ <sup>40</sup> to 10%
Wire Cloth and Netting—	Boardman's.
Painted Screen Cloth, 100 ft.	Always Ready.
\$1.75 to \$2.00	40¢ <sup>40</sup>
Galvanized Wire Netting.	Alligator.
75¢ <sup>40</sup> to 10% <sup>40</sup>	Donohue's Engineer.
Wire Barb—	Eagle.
See Trade Report.	Acme, Bright.
Wire Rope—See Rope, Wire.	Acme, Nickleid.
Wrenches—	Hercules.
American Adjustable.	Walker's.
40¢ <sup>40</sup> to 10%	Diamond Steel.
Baxter's Adjustable "S".	Cincinnati Brace Wrenches.
40¢ <sup>40</sup> to 10%	Taft's Vise Wrench.
Baxter's Diagonal.	55¢ <sup>40</sup>
60¢ <sup>40</sup>	55¢ <sup>40</sup>
Coe's Genuine.	50¢ <sup>40</sup> to 10%
60¢ <sup>40</sup>	50¢ <sup>40</sup> to 10%
Coe's "Mechanics".	65¢ <sup>40</sup> to 10%
65¢ <sup>40</sup>	65¢ <sup>40</sup> to 10%
Girard Standard.	Lamson & Sessions' Engineers.
65¢ <sup>40</sup>	60¢ <sup>40</sup>
Lamson & Sessions' Standard.	Lamson & Sessions' Standard.
70¢ <sup>40</sup>	70¢ <sup>40</sup>
P. S. & W. Agricultural.	Girard Agricultural.
75¢ <sup>40</sup> to 10% <sup>40</sup>	Lamson & Sessions' Agric'l.
W. & B. Diamond.	10¢ <sup>40</sup> to 10% <sup>40</sup>

**Wringers, Clothes—**

Am. Wringer Co.'s list, July 1, 1892.	2¢	cash
Colby Wringer Co., list Sept. 1, '91.	2¢	cash
Lovel Mfg. Co., list July 1, 1892.	2¢	cash
Peerless Mfg. Co., list Feb. 1, 1892.	2¢	cash
National Wringer & Mfg. Co., list June 1, 1892.	2¢	cash

**Wrought Goods—**

Staples, Hooks, &amp;c., list March 17, 1892.

85¢<sup>40</sup> to 10%<sup>40</sup>

# Paints, Oils and Colors.—Wholesale Prices.

**Animal and Vegetable Oils—**

Lined, City, raw.. per gal.	6	50
Lined, City, boiled.	5	53
Lined, Western, raw..	48	50
Lard, City, Extra Winter.	75	76
Lard, City, Extra.	74	75
Lard, City, Extra No. 1.	65	66
Lard, City, No. 1.	55	66
Lard, Western, prime..	73	75
Cotton-seed, Crude, prime..	37	38
Cotton-seed, Crude, off grades.	34	36
Cotton-seed, Summer Yellow, prime..	42	43
Cotton-seed, Summer Yellow, off grades..	40	41
Sperm, Crude.	85	90
Sperm, Bleached Spring.	....	....
Sperm, Natural Winter.	1.00	1.03
Whale, Bleached Winter.	1.65	1.08
Whale, Cetaceo.	....	....
Whale, Natural Winter.	55	56
Whale, Bleached Winter.	58	58
Whale, Extra Bleached.	59	60
Sea Elephant, Bleached Winter.	....	....
Menhaden, Crude, Sound..	49	60
Menhaden, Crude, Southern.	49	60
Menhaden, Light Pressed..	42	43
Menhaden, Bleached W'ter.	45	46
Menhaden, Extra Bleached.	60	65
Tallow, City, prime..	60	65
Tallow, Western, prime..	60	60
Cocoanut, Ceylon..	6	6
Cocoanut, Cochin..	6	64
Cod, Domestic..	38	40
Cod, Foreign..	42	45
Red Elaine..	44	46
Red Saponified..	54	54
Bank.. per gal.	40	41
Straits..	41	42
Olive, Italian, bbls..	58	60
Neatsfoot, prime..	75	80
Palm, prime, Lagos..	74	84

**Paints and Colors—**

Cylinder, dark, filtered..	10	12
Carnaflax, 23 $\frac{1}{2}$ @ 24 gravity..	11	12
Carnaflax, 25 gravity..	10	11
Carnaflax, 28 gravity..	74	8
Carnaflax, red..	94	10%
Barytes, Foreign, 1 b. ton.	\$22.00	24.00
Barytes, Amer. Roasted..	29.00	32.00
Barytes, Amer. No. 1..	16.00	18.00
Barytes, Amer. No. 2..	13.00	15.00
Barytes, Amer. No. 3..	11.00	12.00
Blue, Celestial..	7	8
Blue, Chinese..	40	50
Blue, Prussian..	25	40
Blue, Ultramarine..	8	25
Brown, Spanish..	1	1
Brown, Vandyke, Amer..	3	3 $\frac{1}{2}$
Carmine, No. 40, in bulk..	2.75	2..
Carmine, No. 40, in boxes or barrels..	2.85	2..
Carmine, No. 40, in ounce bottles..	3.75	4..
Chalk, in bulk..	2.40	2.50
Chalk, in bbls..	33	40
China Clay, English..	....	....
Cobalt Oxide, prep'd..	9.00	11.00
Cobalt Oxide, black..	....	....
lots 100 lb. 1.00	....	....
Cobalt Oxide, black..	....	....
less 100 lb. 1.96	....	....
Green, Paris, in bulk..	10	10%
Green, Paris, small pack..	12	17
Green, Chrome, ordinary..	6	12
Green, Chrom., pure..	22	25
Lead, Eng. B.B. white..	84	10
Lead, Amin. White, dry or in oil..	....	....
Kegs, lots less than 500 lb..	7	7 $\frac{1}{2}$
Kegs, lots 500 lb. to 5 tons..	64	64
Kegs, lots 12 tons and over..	64	64
Lead, White, in oil, 25 lb. tin..	....	....
Lead, White, in oil, 12 $\frac{1}{2}$ lb. tin..	....	....
Lead, White, in oil, 1 to 5 lbs. assorted tins, add to keg price..	....	....
Lead, White, in oil, 1 to 5 lbs. sorted tins, add to keg price..	....	....
Lead, Red, bbls. and 1/2 bbls..	6	7
Lead, Red, kegs..	64	74
Litharge, kegs..	64	74
Litharge, bbls. and 1/2 bbls..	6	7

TERMS, &c.—Lead and Litharge.—On lots of 500 lb. or over, 60 days' time or 2 $\frac{1}{2}$ % discount for cash if paid within 15 days of date of invoice.	Zinc, American, dry..	7¢ <sup>40</sup>	10¢ <sup>40</sup>
....	Zinc, French, Red Seal.	7¢ <sup>40</sup>	10¢ <sup>40</sup>
....	Zinc, French, Green Seal.	9¢ <sup>40</sup>	12¢ <sup>40</sup>
....	Zinc, French, V. M. X.	9¢ <sup>40</sup>	12¢ <sup>40</sup>
....	Zinc, Antwerp, Red Seal.	7¢ <sup>40</sup>	10¢ <sup>40</sup>
....	Zinc, Antwerp, Green Seal.	7¢ <sup>40</sup>	10¢ <sup>40</sup>
....	Zinc, German, L. Z. O.	64¢ <sup>40</sup>	74¢ <sup>40</sup>
....	Zinc, V. M. in Poppy Oil, G. Seal.	65¢ <sup>40</sup>	11¢ <sup>40</sup>
....	lots 1 ton and over..	....	....
....	lots less than one ton..	11¢ <sup>40</sup>	11¢ <sup>40</sup>
....	Zinc, V. M. in Poppy Oil, Red Seal.	Red Seal.	10¢ <sup>40</sup>
....	lots of 1 ton and over..	10¢ <sup>40</sup>	10¢ <sup>40</sup>
....	lots less than 1 ton..	10¢ <sup>40</sup>	10¢ <sup>40</sup>
....	Discounts—French Zinc.—Discounts to buyers of 10 bbl. lots of one or more assorted grades, 1 $\frac{1}{2}$ %; 25 bbls., 2 $\frac{1}{2}$ %; 50 bbls., 4%. No discount allowed on less than bbl. lots.	....	....
....	Colors in Oil—	....	....
....	Black, Drop, Frankfort.	25	30
....	Black, Drop, English.	12	15
....	Black, Drop, Domestic.	12	15
....	Black, Lampblack, Best.	20	25
....	Black, Lampblack, Common.	7	15
....	Black, Ivory.	8	15
....	Black, Chinese.	35	45
....	Blue, Prussian.	20	25
....	Blue, Ultramarine.	12	15
....	Brown, Vandyke.	7	12
....	Green, Chrome.	8	13
....	Green, Paris.	16	18 $\frac{1}{2}$
....	Sienna, Raw.	7	14
....	Sienna, Burnt.	7	14
....	Umber, Raw.	7	10
....	Umber, Burnt.	7	10
....	Clue—	....	....
....	Low Grade.	8	10
....	Cabinet.	12	14
....	Medium White.	13	15
....	Extra White.	17	20
....	French.	10	12
....	English.	10	12
....	Irish.	12	12

# THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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**RATES OF ADVERTISING :**

ONE INSERTION - - - - - \$2.00

ONE MONTH, - - - - - 7.50

THREE MONTHS, - - - - - 17.50

New York (Main Office),	96-102 Reade Street,




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# CURRENT METAL PRICES.

JULY 26, 1893:

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

**IRON AND STEEL—  
Bar Iron from Store—**

Common Iron:
1/2 to 2 in. round and square... \$ 1.80 @ 1.90¢
1 to 6 in. x 1/2 to 1 in.... \$ 1.90 @ 2.00¢
Defined Iron:
1/2 to 2 in. round and square. \$ 1.90 @ 2.00¢
1 to 4 in. x 1/2 to 1 in.... \$ 2.10 @ 2.20¢
Rods—1/2 and 1 1/2 round and sq. \$ 2.00 @ 2.10¢
Bands—1 to 6 x 3/16 to No. 12. \$ 2.20 @ 2.30¢
"Burden Best" Iron, base price. \$ 3.00¢
Burden's "H. B. & S." Iron, base price..... \$ 2.80¢
"Ulster"..... \$ 3.00¢
Norway Bars..... \$ 3.75 @ 4.00¢
Norway Shapes..... \$ 4.50 @ 5.00¢

**Merchant Steel from Store—**

Open-Hearth and Bessemer Machinery,
Toec Calk, Tire and Sleigh Shoe, base price in small lots..... 23¢¢
Best Cast Steel, base price in small lots. 8¢¢
Best Cast Steel Machinery, base price in small lots..... 5¢¢

**Sheet Iron from Store—**

Black—
Common R. G. Cleaned American. American.
Nos. 10 to 16. \$ 2 1/2 @ ... 3 1/4¢
17 to 20. \$ 3 @ ... 3 1/4¢
21 to 24. \$ 3 1/4 @ ... 3 1/4¢
25 and 26. \$ 3 1/2 @ ... 3 5/8¢
27. \$ 3 1/2 @ ... 3 1/4¢
28. \$ 3 1/2 @ ... 3 1/4¢
American B. B. \$ 4 @ 4 1/4¢
Russia, Planished, &c. Genuine Russia, according to assortment. \$ 12 @ 13¢
Patent Planished. \$ 10; B. 9¢, 5¢
Craig Polished Sheet Steel. \$ 8 @ 8 1/2¢

**Galvanized.**

Nos. 10 to 16. \$ 4 @ ... 4 1/4¢
17 to 22. \$ 4 @ ... 4 1/4¢
23 to 24. \$ 4 @ ... 4 1/4¢
25 to 26. \$ 4 @ ... 4 1/4¢
27. \$ 4 @ ... 4 1/4¢
28. \$ 4 @ ... 4 1/4¢
29 to 30. \$ 4 @ ... 4 1/4¢

**English Steel from Store—**

Best Cast. \$ 15 @ 16¢
Extra Cast. \$ 16 @ 17¢
Swaged, Cast. \$ 16 @ 17¢
Best Double Shear. \$ 15
Blister, 1st quality. \$ 12
German Steel, Best. \$ 10
2d quality. \$ 9
3d quality. \$ 8
Sheet Cast Steel, 1st quality. \$ 15
2d quality. \$ 14
3d quality. \$ 12 1/2
R. Mushet's "Special" Annealed. \$ 48
" " " Titnic. \$ 75
" " " Titnic. \$ 20

**METALS—**

Tin—
Banca, Pigs. 20 1/2 @ 21¢
Straits, Pigs. 21¢
Straits in Bars. 22¢

**Tin Plates—**

Duty: 2 1/4¢ D.
Charcoal Plates—Bright—
Guaranteed Plates command special prices, according to quality. Per box.
Melyn and Calland Grade. I.C. 10 x 14. @ \$ 8.50
" " " " I.C. 12 x 12. @ 6.75
" " " " I.C. 14 x 20. @ 6.50
" " " " I.C. 20 x 28. @ 13.00
" " " " I.X. 10 x 14. @ 8.50
" " " " I.X. 12 x 12. @ 8.75
" " " " I.X. 14 x 20. @ 8.50
" " " " I.X. 20 x 28. @ 17.00
" " " " DC. 12 1/2 x 17. @ 6.00
" " " " DX. 12 1/2 x 17. @ 8.00
Allaway Grade. I.C. 10 x 14. @ 6.00
" " " " I.C. 12 x 12. @ 6.25
" " " " I.C. 14 x 20. @ 6.00
" " " " I.C. 20 x 28. @ 12.00
Steel Coke. I.C. 10 x 14. 14 x 20. @ \$ 5.40 @ \$ 5.50
10 x 20. @ 8.50
20 x 28. @ 11.50
IX. 10 x 14. 14 x 20. @ 7.00
Steel Coke. I.C. 10 x 14. 14 x 20. @ 6.00
Charcoal Plates—Terne—
Guaranteed Plates command special prices according to quality.
Dean Grade. I.C. 14 x 20. @ 6.65
20 x 28. @ 11.00
IX. 14 x 20. @ 6.40
20 x 28. @ 12.80
Abecarne Grade. I.C. 14 x 20. @ 6.65
IX. 14 x 20. @ 10.80
20 x 28. @ 6.40
IX. 14 x 20. @ 12.80

**Tin Boiler Plates—**

IXX. 4 x 28. 112 sheets. @ \$ 18.35
IXX. 14 x 28. 112 sheets. @ 14.50
IXX. 14 x 31. 112 sheets. @ 16.00
American Terne Plates—Apollo. \$ 6.25
I.C. 14 x 20. 12.50
I.C. 20 x 28. 7.25
I.C. 14 x 20. 14.50
I.C. 20 x 28. 14.50

Discount from list. 30 @ 3%

**Copper—**

DUTY: Pig, Bar and Ingots, 1/4¢; Old Copper, 1¢ D. Manufactured (including all articles of which Copper is a component of chief value), 35% ad valorem.

**Ingot—**

Lake. @ 11 1/2¢ Asonia grade Arizona. @ 11¢ Asonia grade Casting. @ 10 1/2¢

**Sheet and Bolt—**

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15% @ 25%, according to size of order.

Weights per sq. foot and prices per pound.

Not wider than	Over 64 oz.	Weights per sq. foot and prices per pound.							
		22	23	24	25	26	27	28	29
22	22	22	23	24	25	26	27	28	29
23	23	23	23	24	25	26	27	28	29
24	24	24	24	25	26	27	28	29	30
25	25	25	25	26	27	28	29	30	31
26	26	26	26	27	28	29	30	31	32
27	27	27	27	28	29	30	31	32	33
28	28	28	28	29	30	31	32	33	34
29	29	29	29	30	31	32	33	34	35
30	30	30	30	31	32	33	34	35	36
31	31	31	31	32	33	34	35	36	37
32	32	32	32	33	34	35	36	37	38
33	33	33	33	34	35	36	37	38	39
34	34	34	34	35	36	37	38	39	40
35	35	35	35	36	37	38	39	40	41
36	36	36	36	37	38	39	40	41	42
37	37	37	37	38	39	40	41	42	43
38	38	38	38	39	40	41	42	43	44
39	39	39	39	40	41	42	43	44	45
40	40	40	40	41	42	43	44	45	46
41	41	41	41	42	43	44	45	46	47
42	42	42	42	43	44	45	46	47	48
43	43	43	43	44	45	46	47	48	49
44	44	44	44	45	46	47	48	49	50
45	45	45	45	46	47	48	49	50	51
46	46	46	46	47	48	49	50	51	52
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49	49	49	49	50	51	52	53	54	55
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52	52	52	52	53	54	55	56	57	58
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62	62	62	62	63	64	65	66	67	68
63	63	63	63	64	65	66	67	68	69
64	64	64	64	65	66	67	68	69	70
65	65	65	65	66	67	68	69	70	71
66	66	66	66	67	68	69	70	71	72
67	67	67	67	68	69	70	71	72	73
68	68	68	68	69	70	71	72	73	74
69	69	69	69	70	71	72	73	74	75
70	70	70	70	71	72	73	74	75	76
71	71	71	71	72	73	74	75	76	77
72	72	72	72	73	74	75	76	77	78
73	73	73	73	74	75	76	77	78	79
74	74	74	74	75	76	77	78	79	80
75	75	75	75	76	77	78	79	80	81
76	76	76	76	77	78	79	80	81	82
77	77	77	77	78	79	80	81	82	83
78	78	78	78	79	80	81	82	83	84
79	79	79	79	80	81	82	83	84	85
80	80	80	80	81	82	83	84	85	86
81	81	81	81	82	83	84	85	86	87
82	82	82	82	83	84	85	86	87	88
83	83	83	83	84	85	86	87	88	89
84	84	84	84	85	86	87	88	89	90
85	85	85	85	86	87	88	89	90	91
86	86	86	86	87	88	89	90	91	92
87	87	87	87	88	89	90	91	92	93
88	88	88	88	89	90	91	92	93	94
89	89	89	89	90	91	92	93	94	95
90	90	90	90	91	92	93	94	95	96
91	91	91	91	92	93	94	95	96	97
92	92	92	92	93	94	95	96</		

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